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ABSTRACT

Part of a program of publications concerning the status and advancement of women coordinated in four journals by the Group for Initiatives on Women and Development, this issue of "Children in the Tropics" focuses on mothers' health. Section I describes factors conditioning the health and nutritional status of women and girls. Discussion centers on life expectancy at birth, maternal mortality rate, and birth rate. Section II focuses on aspects of maternal and child health, including nutritional requirements of pregnant and lactating women; weight gain during pregnancy; mothers' age, number of children, and interbirth interval; maternal nutritional status, breast-feeding, and interbirth interval; anemia; work and women's health; pregnancy in adolescents; abortion; the growth of girl children, starting in the intrauterine period, and their ability to bring pregnancies to term when they reach childbearing age; and sexual mutilations. Section III briefly reports actions aimed at improving women's health in the areas of education, surveillance of pregnant women, food supplementation, planned parenthood, appropriate technology, and legislation. In conclusion, health problems facing rural women are pointed out. Numerous tables and graphs are provided. (RH)

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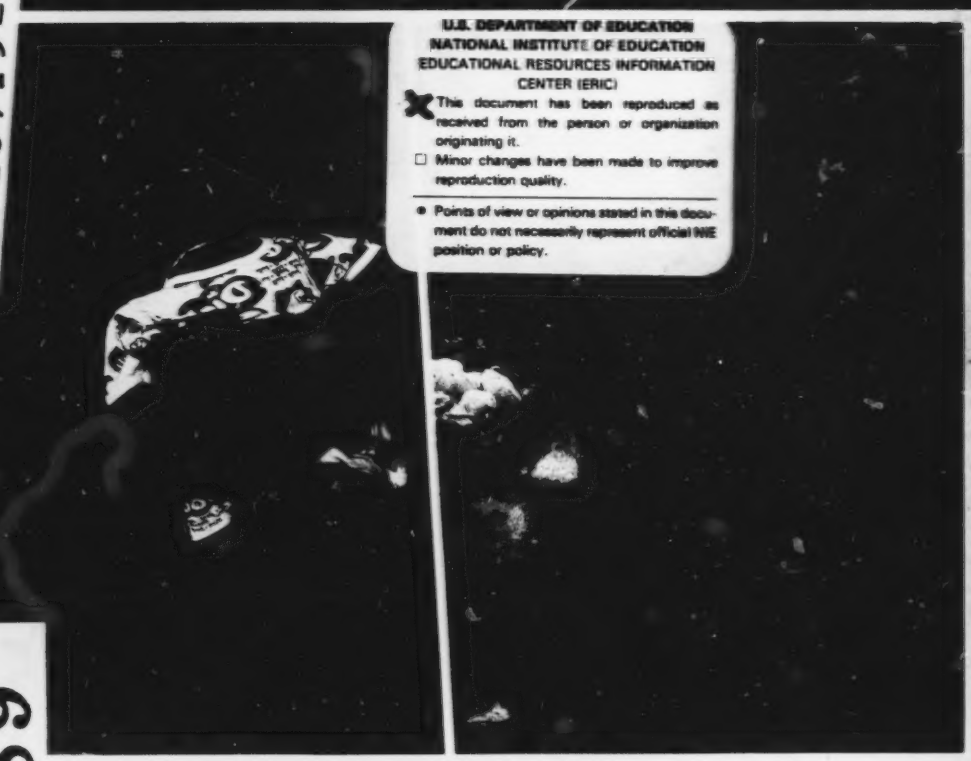

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1985 - N° 159 - WOMEN'S LIVES, MOTHERS' HEALTH

in the TROPICS

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The International Children's Centre was created by the French government in 1949, on the initiative of Professor Robert Debré in particular, following negotiations between France and the United Nations. Its purpose was to furnish those international and national agencies dealing specifically with child care with training facilities and educational and informational tools in the field of child health and development, viewing children within their family and surroundings.

ICC soon turned essentially toward Third World children and devoted its activities to the training and education of personnel with social, educational and administrative responsibilities as well as medical and paramedical workers. The desire for greater efficiency has led it to work increasingly with trainers and to concentrate its efforts on the methodological and educational aspects of mother and child care programmes.

ICC is also engaged in an attempt to further study — and — action on some aspects of the life and health of children and their family, so as to contribute to practical improvement, particularly in the fields of growth, nutrition, planned parenthood, the control of transmissible and nutritional diseases, preschool and school education, the needs of disabled and underprivileged children, etc.

Over this period of more than 30 years, a large amount of documents on children and adolescents, mostly from the developing countries, has been accumulated. This international documentation has been classified and sorted out, and has been computerized since 1983 : a bibliographic data base (BIRD : "Base d'Informations Robert Debré") may be consulted anywhere in the world, through international communications networks. ICC also publishes periodicals, educational documents and specialized bibliographic bulletins.

As for its legal status, the International Children's Centre is a foundation under french law of recognized public utility, administered by an executive board with broad international membership.

1985 - N° 159

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GENERAL INTRODUCTION BY THE GROUP FOR INITIATIVES ON WOMEN AND DEVELOPMENT (GIFED)*

Ten years have already gone by since the United Nations celebrated the year for women. What is the situation in 1985, at the end of this decade? Can we see any tangible achievements? Do women, and third world women in particular, still seem to remain in the background, where reflexion and action is concerned?

The 1980 conference in Copenhagen acknowledged the failure up to then, but this did not generate the hoped-for revival of field work. The initiatives made by various women's groups were unable to develop their full originality, since they have been co-opted by the various political systems. In France, few effective structures for research or coordination have been set up since 1975.

The Group for Initiatives on Women and Development (Groupe d'Initiative Femmes et Développement - GIFED) was created in 1983 in order to fill this institutional gap, by women from many geographic and professional horizons, who met to share their experience. They aimed at working at the development of a new world order in which women would at last be full fledged partners, even if its achievement seems a long way off.

The GIFED is convinced that the Nairobi Conference should not simply mark the end of the Decade for Women, but should open a new, fertile epoch for action. These papers are proposed for general reflexion, in the hope that they will both encourage popular action initiated by women, and will reenforce their collective pressure on the general orientation of future projects.

Within this perspective, the GIFED has defined the following objectives:

— to be a tool for information, communication and exchanges, at the disposal of individual women and groups of women in both Northern and Southern countries;
— to promote studies, research and action contributing to women's improved integration in the economic, social and cultural spheres;
— to reinforce the participation of women in all national and international agencies involved in reflexion.

In order to achieve them it has decided to undertake a coordinated publication programme in four journals. Each will print texts on that one of the following four themes which is most appropriate to its readership:

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* Nonprofit organization (1901 law). 176, quai Louis Blériot. 75016 Paris, France.

— **education, research, the medias: means of access or blind alleys for women?** in "Les Cahiers de Direct" (1);
— **leaving the invisible work world: women in the economy,** in "Tiers-Monde" (2);
— **women's improved well-being: the health of third world women,** in "Children in the Tropics";
— **women and time,** in "Recherche, Pédagogie et Culture" (3).

Publication of "Recherche, Pédagogie et Culture" has been suddenly discontinued, owing to the termination of its subsidization by the Ministry of Cooperation and Development. We sincerely regret the disappearance of this thirteen year-old journal, which many of our readers from Africa or interested in it have had the opportunity to appreciate.

Some parts of the special issue on "Women and time", which was ready for publication, appeared in the journal "Les Cahiers de Direct" (Agence de Coopération Culturelle et Technique), in co-publication with the Tierce publishing company, in June 1985, under the title "In search of women's time, education, communication, paces in life".

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Translated from French to English by Helen ARNOLD.

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by Mrs Angèle HOUDEGBE

Editorial

Why is the journal "Children in the Tropics" devoting an issue to mothers' health in 1985, precisely at the end of the United Nations decade for women? Hasn't everything been said already? The answer is surely yes, and yet, we feel it is important to present one more analysis of those factors in women's life which influence their health, so as to encourage our readers to reflect on this question in their life and work situations. Only then may we improve the lives of women around the world, and more particularly in the most isolated areas.

It is alarming to observe that in 1985 many countries still have only a highly approximate idea of the maternal mortality rate. Does this mean that many women die without the health officials' having any knowledge of the fact or of its exact causes? And yet, it is easy to imagine the social, psychological and emotional repercussions of a mother's death. Such epidemiological ignorance results in the implementation of programmes which do not take this population into account. Field workers often note that women of childbearing age rarely receive attention: the percentage of women from underprivileged backgrounds who attend pre and postnatal consultations is low, as is that of women whose birthing is attended by a qualified worker.

Health policies aimed at children have received much attention in the last few decades. Concretely, these have not yet yielded the expected results, but recent research indicates increasingly clearly that human development is an ongoing process and must be apprehended as a whole. The word "development" is used here to designate the entire constellation of phenomena which contribute to the gradual transformation of human beings from conception to adulthood (physical growth, maturation, psychological, sensory and motor development, emotional, cognitive and social development). Practically speaking, this means that surveillance of children should begin at conception rather than at birth, since the mother's health and nutritional status during gestation constitute most important factors influencing foetal growth and, subsequently, the child's development during the first stages of life. The mother-child dyad should be inseparable, where health policy is concerned.

Some workers suggest that nutrition and health action might be more effective for the next generation if they first concerned themselves with prepuberal girls. In many underprivileged groups, the history of women's life is as follows: conception immediately after puberty, childbirth and breast-feeding until the next pregnancy. This cycle often begins before the adolescent's own growth is terminated, and recurs repeatedly until menopause, often under terribly precarious conditions.

A strictly medical analysis of women's basic health problems shows that some of these are extremely important, and yet go unnoticed: social status, physical and mental exhaustion, chronic fatigue, increasing responsibilities due to urbanization or the migration of men, etc. In a poverty-stricken, malnourished community, men and women endure the same conditions, of course, but women are clearly even more underprivileged. This issue of "Children in the Tropics" has no intention of making a plea for the feminist cause;

rather, it describes some phenomena which are strictly limited to women. This implies that we visualize integrated actions aimed at factors which lie in the domain of different agencies.

The three key ideas of this reflection on women's lives are:

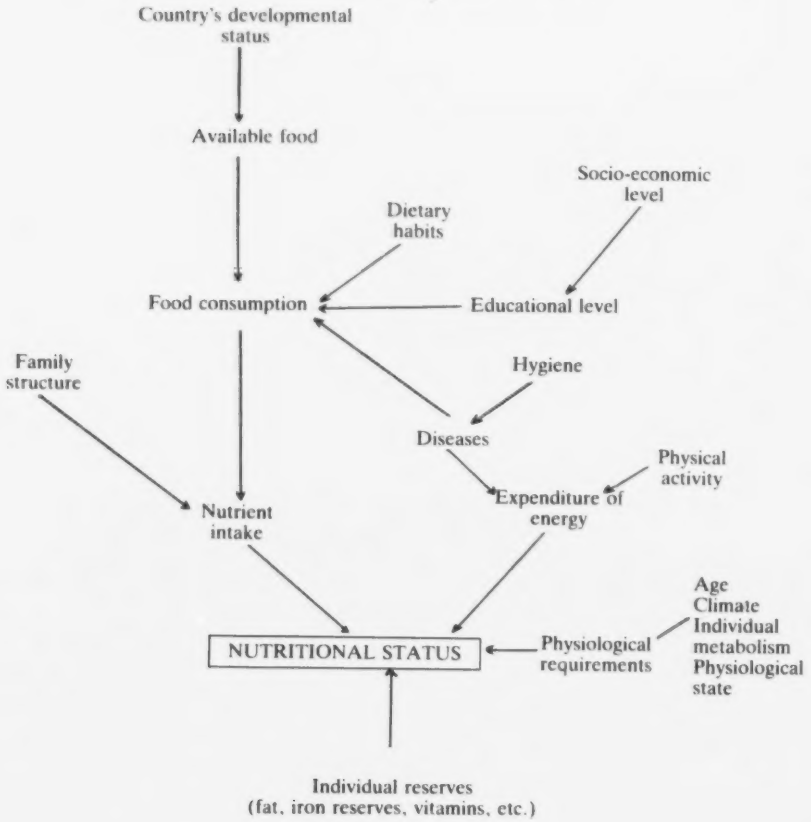
— women's health should be taken into account as well as children's health;
— the development of the whole human being should be respected. This implies ongoing surveillance of the health status of women and of their children;
— the overall living conditions of women within the family and society must be analysed at the different phases of their life, so as to encourage integrated actions rather than a sprinkling of uncoordinated efforts.

I. FACTORS CONDITIONING THE HEALTH AND NUTRITIONAL STATUS OF WOMEN AND GIRLS

Women's health status, like everyone else's, depends on a multitude of socio-economic and sanitational factors. Figure 1 illustrates several of the many interrelations between the various factors which influence the nutritional status of all **individuals.**

Figure 1

Factors influencing individual nutritional status

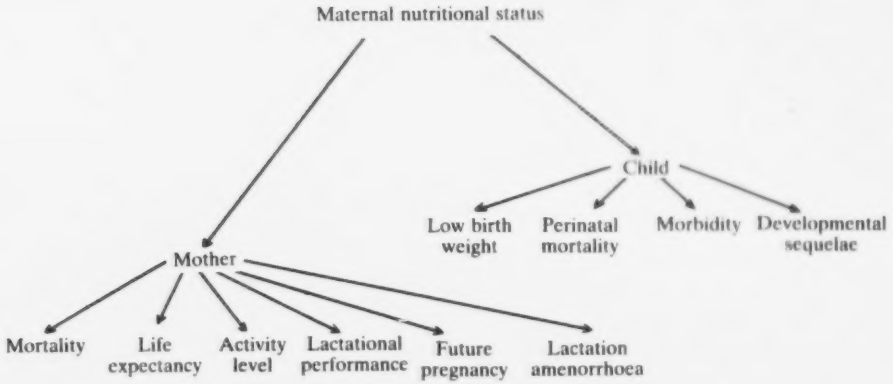


Women of childbearing age are at greater risk than other population groups, owing to their reproductive function and their ability to nurse children: pregnancy, like lactation, generates metabolic changes and increases nutritional needs. Delivery itself presents a series of risks for the woman's health, and only regular surveillance of pregnancy may prevent many of these.

A woman's health status and, above all, her nutritional status during pregnancy and delivery condition not only her future health and ability to assume the many tasks which are hers, but the health and development of her child as well (see fig. 2). As far as health and development are concerned, the **mother-child couple** cannot be separated.

Figure 2

Outcomes of the mother's nutritional status for herself and her child



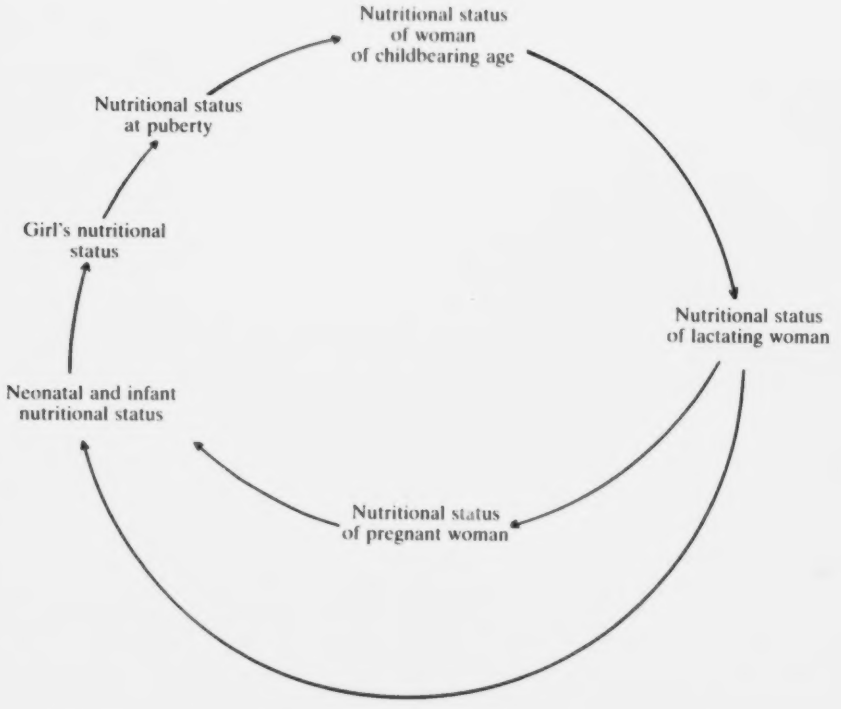
Taken from : Y. HOFVANDER. Maternal and Young Child Nutrition. UNESCO Nutrition education series 3. Paris, 1983, page 10.

In the case of a girl child, retarded development during the intrauterine period and the first years of life increases the chances of inadequate reproductive functioning and diminishes her ability to accomplish some of the activities which make up women's everyday life.

More than in any other individual, there is a dynamics to women's nutritional status, since it may have negative consequences for the **following generation** (fig. 3).

Figure 3

Cyclic intergenerational influence of maternal nutritional status


Nutritional status of woman of childbearing age
Nutritional status at puberty
Girl's nutritional status
Neonatal and infant nutritional status
Nutritional status of pregnant woman
Nutritional status of lactating woman

If we are to understand the nutritional situation as completely as possible and act to improve it, we must analyse the interactions between the multiple factors at work. This may be done through indicators: these are **quantifiable** measurements of events, which serve to inform us of certain phenomena: their measurement at regular intervals enables us to assess their evolution and therefore the impact of the programmes implemented in order to improve the situation.

1. LIFE EXPECTANCY AT BIRTH

Life expectancy at birth is an indicator of a country's level of development and of the overall health status of its population.

Life expectancy at a given age in a given country means the **average** number of years which a person of that age may expect to live, according to the mortality rate in that country. For public health purposes, life expectancy at birth is generally used.

A comparison of this figure in different countries shows considerable differences: in the industrialized countries it ranges from 70 to 76 years, in Africa it is between 40 and 55 years, in the developing Asian countries it ranges from 37 to 65 years, while it is between 50 and 70 years in Latin America. These major differences result mainly from the enormous differences in mortality before the age of one year and before the age of 5 years, which in turn are due to a series of socio-economic, health and nutritional factors linked with the country's development status.

While about 10 out of 1,000 live-born children die before age 5 in the industrialized countries, the figures reach 200, or even 400 children for 1,000 live-born infants who die before that age in many developing countries: that is, 20 to 40 times more.

Table 1 shows the life expectancy at birth for children of both sexes. It shows that when the average life expectancy of all individuals in a country is low, the difference in life expectancy at birth of males and females is slight, women generally having a longer life expectancy. However, in certain countries where the life expectancy is shortest, men live longer than women, on the average.

The recent evolution of this figure in the industrialized countries shows that the difference between the sexes tends to increase, to women's benefit.

Both of these trends exist in a country such as Brazil, where huge differences in development separate the various regions: the difference in life expectancy at birth is 3.5 years in the Nordeste, a poor region (51.2 years for men as against 54.7 years for women), while it reaches 6.8 years in the rich southeastern region (62.5 years as against 69.3).

Table 1

Sex-linked life expectancy at birth in different countries (number of years)

Countries	Men (1)	Women (2)	Difference (2) — (1)
Canada (1982)	72.0	79.0	+ 7
USA (1980)	70.1	77.8	+ 7.7
Bulgaria (1982)	68.5	74.0	+ 5.5
France (1981)	70.9	79.1	+ 8.2
Sweden (1982)	73.5	79.6	+ 6.1
Nigeria*	37.2	36.7	− 0.5
India*	41.9	40.5	− 1.4
Jordan*	52.6	52	− 0.6
Pakistan*	53.7	48.8	− 4.9
Bangladesh*	35.8	35.8	0

* Taken from the Demographic Yearbook for 1975, United Nations quoted by M. Bekele in Assignment Children. 48/50. p. 71. 1980.

Why are there such sex-linked differences?

In the developing countries, the infant mortality rate (1) ranges between 80 and 200 per 1,000 (compared to 10 per 1,000 in the industrialized countries). This heavily influences the figures for life expectancy at birth. And yet, table 2 shows that girls do not die more often during the first year of life.

Table 2

Sex-linked infant mortality in different countries (in ‰)*

Countries	Boys (1)	Girls (2)	Difference (2) — (1)
Costa Rica (1980)	22	16	− 6
Chile (1980)	35	28.6	− 6.4
Cape Verde Islands (1980)	75	52.2	− 22.8
Egypt (1975-1979)	81	83	+ 2
USA (1979)	14.5	11.5	− 3
Japan (1981)	7.8	6.4	− 1.4
France (1980)	11.5	8.4	− 3.1
Bulgaria (1981)	21.1	16.6	− 4.5
Pakistan (1979)	120	117	− 3
Rural Bangladesh (1974-1977)	130.9	131.5	+ 0.6

* Taken from the World Health Statistics Annual, 1983. WHO Geneva.

The sex-linked differences in life expectancy at birth are the result of endogenous (biological) factors, and exogenous (environmental and socio-economic) factors. The smaller gap noted in the developing countries is essentially due to **the excessive mortality of women during their fertile years,** owing to the consequences of rapidly succeeding pregnancies and periods of lactation.

In some areas such as South-East Asia, this excessive mortality begins during the post-neonatal period (after the 4th week of life), since less attention is paid to the health and diet of girls than to that of boys: in the Matlab (Bangladesh) region, neonatal mortality is greater in boys, as is the case throughout the world, because newborn boys are more fragile, but during the post-neonatal period and between the ages of 1 and 4 years, girls die more frequently than boys.

2. MATERNAL MORTALITY RATE

In the developing countries, the death rate for women of childbearing age is highest during pregnancy and delivery. In Africa and Asia, one fourth of all deaths in women of childbearing age are caused by a pregnancy, whereas pregnancies only account for 2 % of

(1) Number of children who die before their first birthday per 1,000 live births.

deaths in those women in the developed countries. This is the most dramatic consequence of the malnutrition and infectious and anaemic conditions suffered by these women, and which are worsened by a lack of surveillance during their pregnancies, as well as by inadequate obstetrical practices, excessively frequent pregnancies and, often, intense physical labour.

Table 3

Infant mortality rates by sex in Matlab (Bangladesh 1974-1977)

	Mortality rate			
	neonatal 0 - 1 month	post-neonatal 1 - 14 months	1 - 4 years*	5 - 14 years
Boys	78.2	52.6	23.3	2.7
Girls	67.6	63.9	33.9	3.7

* 1975-1977.

Taken from : S. D'SOUZA, L.C. CHEN. Sex differentials in mortality in rural Bangladesh population and development review. 1980, 6 ; 2 : 257-270.

A high death rate among mothers means that there is a large proportion of women of childbearing age who, while they do not die during their pregnancy, live with a persistent precarious state of health which affects their children's health and is incompatible with an acceptable social life. In India, a study has shown that for each mother who died there were 16.5 cases of illness generated by pregnancy or delivery.

The maternal mortality rate is an indicator which measures the number of deaths occurring in women during pregnancy (or caused by miscarriage) and within 42 days following the termination of gestation, for any reason determined by or worsened by pregnancy. This figure is calculated per 100,000 births.

In most countries this figure is not clearly established, since little attention is paid to this type of mortality (only 23 % of Third World governments furnished the United Nations with estimations of maternal mortality in their country between 1977 and 1981) and because a great many deliveries take place outside of any health structure, while pregnancy surveillance is often lacking.

According to a WHO estimation, some 500,000 women around the world die of post-obstetrical complications each year. The causes are numerous: infections, sepsis, anaemia, haemorrhaging, hypertension, etc.

Table 5 shows the maternal mortality rate, as determined by the international agencies, is in a ratio of 1 to 1,500, between Sweden and Bangladesh.

If we are to evaluate the health status of women of childbearing age and the effectiveness of the measures taken in the framework of mother and child care programmes, it is indispensable for us to collect data on the regional and national maternal mortality rates. Indeed, if we succeed in improving women's health, the first consequence will be the lowering of this mortality rate.

Table 4

Percentage of births attended by trained workers

Developing countries	48 %
Africa	34 %
Latin America	64 %
Asia (except Japan)	49 %
Oceania (except Australia and New Zealand)	34 %
Europe	97 %
North America	100 %
Developed countries	98 %

Taken from : Coverage of maternity care. A tabulation of available information. WHO. Division of Family Health. 1985. Geneva.

Table 5

Maternal mortality rate in different countries

Country	Year	Maternal mortality rate
Benin	1975	170
Niger	1982	420
Madagascar	1979	300
Ethiopia (Addis Abeba)	1984	3 500
Cuba	1982	48
Ecuador	1978	220
Brazil	1980	100
Bangladesh	1983	3 000
India	1978	480
Vietnam	1982	100
Sweden	1981	4*
France	1981	16*
Hungary	1981	18*
U.S.A.	1979	10

* Including death following abortion.

Taken from : Maternal mortality rates. A tabulation of available information. WHO. Division of Family Health. 1985. Geneva.

An improved definition of the priorities of all mother and child care programmes also requires that we record the immediate cause of every maternal death (sepsis, haemorrhaging, etc.) and the contributing factors (malnutrition, high blood pressure, anaemia, interval between pregnancies, age, etc.). Only this systematic collection of data at a local level and its analysis at a regional and national level will enable us to implement those actions which are needed, and thus to improve the situation.

3. THE BIRTH RATE

The strong interrelations between the mother's nutritional status and the health status of her children is accentuated by the very high birth rates prevailing in the developing countries. The "birth rate" indicator shows the number of live births during one year, per 1,000 individuals within the given population. For example: a birth rate of 35 ‰ in a village of 2,000 individuals means that at the end of the year there are 70 children aged 0 to 1 year old. A high birth rate indicates both a high frequency of births at the beginning and at the end of women's fertile period and short intervals between births. It also means that pregnancy and lactation reccur in rapid succession during women's childbearing years. It is during those same years that their various other tasks are most demanding.

Their health and nutritional status conditions the status of their many children, and is in turn affected by these repeated pregnancies and periods of lactation.

Despite the recent trend toward lower birth rates, these remain very high, exceeding 45 ‰ in most African countries, ranging from 20 to 40 ‰ in Latin America and neighbouring 35 ‰ in the developing Asian countries, in contrast with the 17 ‰ observed in North America and 14 ‰ in Europe. Women in the developing countries often have an average of 6 to 7 children during their childbearing years, whereas the women in developed countries average 2 children (table 6).

It is estimated that at any given time one woman out of six aged 15 to 49 years in the third world is pregnant and 140 million out of 500 million are breast-feeding.

Table 6

Birth rate and average number of children per woman in various countries

Country	Birth rate 1980-1984 (‰)*	Average number of children per woman - 1980-1985**
Kenya	53.5	8.1
Congo	44.2	6.0
Algeria	47.7	7.2
Benin	48.5	6.7
Ecuador	40.6	6.0
Mexico	36.2	4.9
Colombia	31.0	3.9
Bangladesh	45.2	6.2
Laos	41.5	5.8
India	32.6	4.5
France	13.8	1.8
U.S.A.	17.4	2.0

* World Health Statistics Annual 1983. WHO. Geneva.

** International Planned Parenthood Federation. Fécondité et planning familial. 1984.

II. WOMEN'S LIFE, MATERNAL AND CHILD HEALTH

1. NUTRITIONAL REQUIREMENTS OF PREGNANT AND LACTATING WOMEN

In the developed countries, a pregnancy which follows a normal course under satisfactory conditions enables the mother to deliver a child weighing 3,300 to 3,400 g at birth, on the average. During her pregnancy, the woman will have gained 12.5 kg (according to research by F.E. HYTTEN and I. LEITCH). This weight is distributed as follows:

— Foetus	3,400 g
— Placenta	650 g
— Amniotic fluid	800 g
— Uterus	970 g
— Mammary gland	405 g
— Mother's blood	1,250 g
— Extracellular and extravascular fluids	1,680 g
— Other gains, fat deposit	3,345 g
TOTAL	12,500 g

During the breast-feeding period (lactation) a healthy, well-nourished woman can secrete 700 to 850 cc/day of milk containing 65 to 70 Kcal per 100 cc.

The added nutritional requirements inherent in these periods of pregnancy and lactation have led specialists to suggest that women's intake be increased by 100 to 150 Kcal during the first three months of pregnancy, by 250 to 350 Kcal during the last two trimesters of pregnancy, and by 20 g of protein a day during the second half of pregnancy.

During lactation a supplement of about 500 Kcal per day is required, but this figure varies with the fatty reserves accumulated during pregnancy and the usual diet.

These figures must be adjusted to the individual's living conditions (climate, temperature, prior nutritional status, physical activity, etc.). The needs of mothers whose intake is 2,500 are clearly different from those of women who consume 1,500 Kcal, and this figure is encountered in some regions.

The "cost" of pregnancy and lactation in terms of other nutrients is equally high, and must be compensated by supplementation. This is particularly important in the case of iron and folic acid, the haematopoietic nutrients. The total iron requirement during pregnancy is 1,035 mg, with a net loss of 565 mg following delivery (cf. n° 133 of this journal, p. 12). Breast milk contains 0.5 to 1 mg of iron per liter, and the mother must draw that amount from her reserves and/or her diet. These additional requirements have led to the recommendation that 3 mg/day of iron **effectively absorbed** by the intestinal mucosa be consumed during the second half of pregnancy and 2.4 mg/day during lactation. The recommended folic acid intakes are 400 micrograms/day during the second half of pregnancy and 300 micrograms/day during lactation.

Intake of vitamin A, calcium and vitamin D should also be increased.

Table 7

Recommended intake of vitamins A and D and calcium

	Iron (mg)	Calcium (g)	Vitamin A (micrograms)	Vitamin D (micrograms)
Pregnancy, 2nd half	3	1.0 to 1.2	750	10.0
Lactation	2.4	1.0 to 1.2	1 200	10.0

These somewhat theoretical recommendations must be examined in the light of reality, and adjusted accordingly. All of these requirements and intakes have been calculated on the basis of populations of healthy adult women with a satisfactory nutritional status, moderately active during their pregnancy and lactation period. The case is not the same for the poor people who constitute the major part of the population of the developing countries.

The women in these countries have often suffered from malnutrition during their own childhood, are small, have practically no food reserves and a precarious nutritional status, and are subjected to the further stress of frequent infectious and parasitic diseases. In addition, they do not lighten their heavy work load during the periods of pregnancy and breast-feeding.

There are few studies of the effects of these women's deficiencies on their own health; we are better informed of the effects of malnutrition on the newborn, or on the woman's milk production, quantitatively and qualitatively speaking.

2. WEIGHT GAIN DURING PREGNANCY

A study of the distribution of birth weights of children of different groups of women shows that several factors are at work: the mother's age and parity, the interval between pregnancies, the weight gain during pregnancy, but also the mother's height and above all her weight before the onset of pregnancy. Obese women, for instance, may give birth to children with a satisfactory birth weight, or even one above normal, even if they gain less than the recommended 11 kg during their pregnancy.

On the other hand, women whose weight is normal, and who gain less than 11 kg during pregnancy, give birth to children with a lower birth weight, on the average. Women who are underweight at the beginning of their pregnancy run a greater risk of having a child with a below-normal weight for gestational age; in other words, with retarted intrauterine growth.

During the 1944/1945 famine in Rotterdam (1), the average weight gain of pregnant women dropped from 12 to 2 kg, while the average birth weight dropped by only 240 g. During the siege of Leningrad, on the other hand, (2), the average birth weight fell by 600 g.

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(1) C. SMITH. Effects of maternal undernutrition upon the newborn infant in Holland, 1944-1945. J. Pediatr. 1947,30 : 229-243.

(2) A.N. ANTONOV, Children born during the siege of Leningrad in 1942. J. Pediatr. 1947,30 : 250-259.

The difference between these two situations is the duration of the food shortage: the Rotterdam situation "only" lasted 8 months, so that women could use their reserves, whereas the Leningrad dearth lasted 18 months.

Women's nutritional status before their pregnancy is a most important factor, which must be taken into consideration.

Indeed, women suffering from malnutrition have a far greater proportion of children with a birth weight under 2,500 g, for whom the risk of death is substantially higher in the developing countries.

This higher mortality rate in children weighing less than 2,500 g at birth has direct, negative effects on women's health, for they may become pregnant again rapidly, while their nutritional state not only has not improved, but may well be worsened, since they have already depleted their own reserves for the previous pregnancy. It is well known that when infantile mortality decreases, the number of children per woman also decreases.

"Statistically, there is a tendency for parents who have lost a child to have 0.5 more children than those whose children all survived". (UNICEF. La situation dans le monde, 1985, p. 22).

A study done by ROSSO (1) of underprivileged women in the U.S.A. illustrates this perfectly: the women were divided into three groups according to their weight: height ratio before pregnancy was 89 % of the norm or less, 90 to 110 % of the norm or over 110 %.

The weight gain during pregnancy was divided into three classes for each of these groups: under 7 kg, 7.1 to 14 kg, over 14 kg. Table 8 shows the results.

Table 8

Effect of weight gain during pregnancy on the birth weight (in g) of children of women with different weight/height ratios before pregnancy

Weight gain during pregnancy	Pre-pregnancy weight/height ratio		
	89 % of the norm or under	normal	111 % or over
7 kg or less	2,731.4	3,028.7	3,473.4
7.1 - 14.0 kg	3,093.2	3,280.6	3,560.9
Over 14.1 kg	3,387.0	3,490.5	3,514.7

Weight gain during pregnancy plays a particularly important role in the child's birth weight when the mother's weight was low before her pregnancy. This role is also important for the women whose weight was normal, but not for those who were overweight. Table 8 also shows that there was practically no difference in birth weight when the weight gain exceeded 14.1 kg.

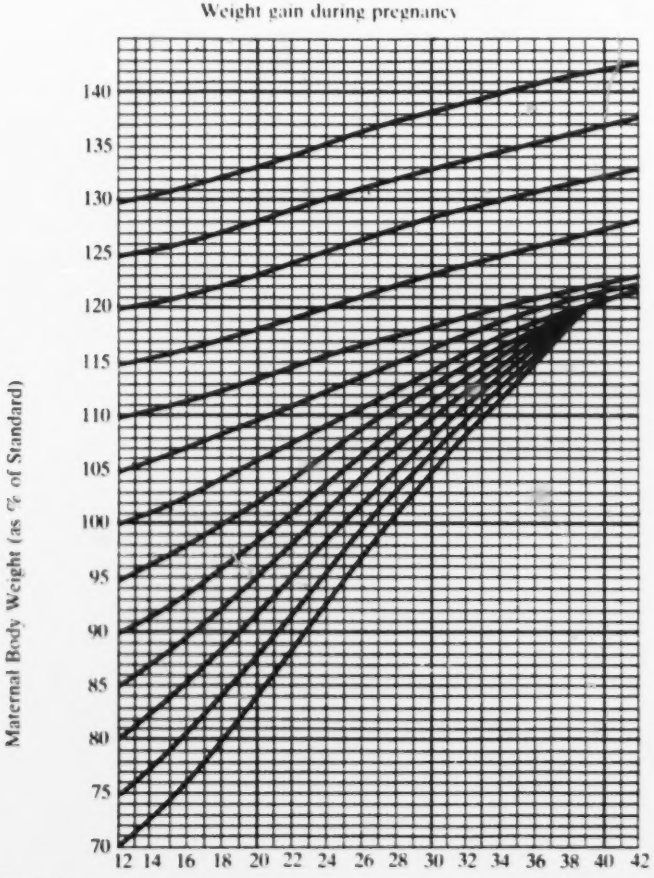
(1) P. ROSSO. A new chart to monitor weight gain during pregnancy. Am. J. Clin. Nut. 1985,41 : 644-652.

Surveillance of weight gain throughout the course of pregnancy therefore enables us to take appropriate measures at a sufficiently early date, so that the newborn will have an optimal weight at birth. The desirable weight gain should be defined in accordance with the mother's weight and height before pregnancy. It should be proportionately greater for lighter women and those with a low weight/height ratio than for heavy women.

ROSSO proposes a chart taking these factors into account (fig. 4). A woman's relative weight (expressed as a percentage of the normal weight for height) may be determined at

Figure 4

Chart to monitor weight gain during pregnancy considering pre-pregnancy weight and height

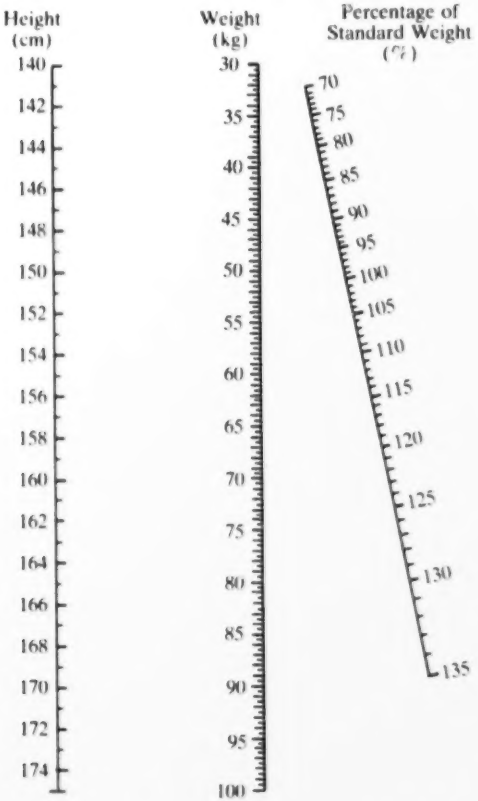


Taken from : P. ROSSO. Op. Cit.

all times, thanks to the diagram shown in fig. 5. To do so, the woman's height and weight must be measured, and the two points on the two vertical scales on the left joined by a line, using a ruler. The percentage is then read on the scale on the right, then placed on the chart in fig. 4 at the point where it crosses the gestational age. To interpret this information, the woman's weight before pregnancy must be known.

Figure 5

Nomogram to determine adequacy of weight for height and to calculate desirable total weight gain during pregnancy



Taken from : P. ROSSO. Op. Cit.

Example: a woman measures 152 cm and weighs 44 kg. According to fig. 5, her weight is 84 % of the "normal" weight for height. She comes for a consultation 20 weeks after the beginning of her pregnancy. The intersection of the column 20 and of the thick line at 85 % of weight for height (close to her 84 %) on the diagram (fig. 5) shows that her weight/height ratio should be 95 % at 20 weeks if her pregnancy is to run a normal course.

She weighs 46 kg at that point, and her height has not changed, of course. The diagram (fig. 5) shows that this corresponds to a weight/height ratio of 87 %, substantially below the necessary 95 %. We must therefore do everything in our power to improve her weight gain: better diet, rest, hygiene, and ask her to return to the consultation within a month.

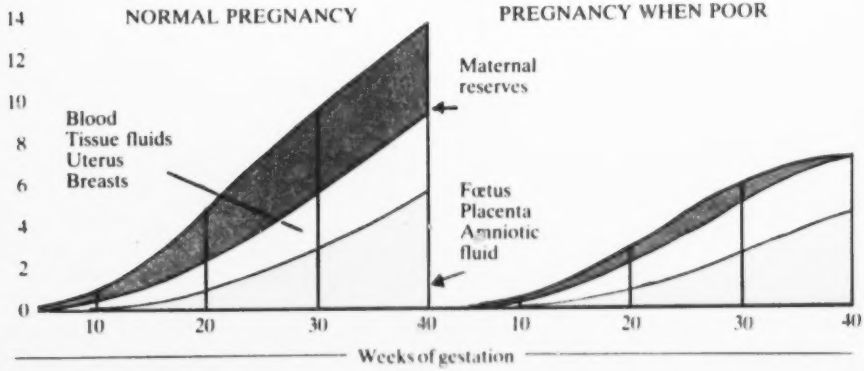
Test (1): a woman weighs 63 kg and measures 162 cm.

1. What is her weight/height ratio, expressed in percentage of the "normal" ratio?
2. She consults when 28 weeks pregnant. What percentage of the "normal" weight/height ratio should she have if the outcome of her pregnancy is to be satisfactory?
3. She then weighs 66 kg. What percentage of the ideal weight/height ratio does this represent?
4. What conclusions do you draw? What do you suggest to the mother?

Figure 6 illustrates the effects of weight gain during pregnancy on the various parts of the woman's body which are enlarged during that period. A pregnancy carried through under poverty-level conditions entails a low weight gain, sometimes only half of the weight gained under normal conditions. This results in a lower birth weight for the child, in particular.

Figure 6

Influence of poverty on weight gain during pregnancy



SOURCE : Allaitement maternel, fécondité et contraception, préparé pour la Fédération internationale pour la planification familiale (IPPF) par Ronald L. Kleinman et Pramilla Senanayake, Publications médicales, 1984.

(1) Answers :
1. 109 %
2. 117 %
3. 115 %
4. Excepting any other type of possible complication (high blood pressure, anaemia, etc.), the pregnancy is proceeding well. The woman will be asked to consult one month later.

When the mother's consumption is very low in comparison with her needs, the weight gain may be even lower than that mentioned in figure 6 (and this is frequent in some population groups); the mother's reserves are depleted. These reserves are absolutely necessary, however, if breast-feeding is to proceed normally, and the woman is to recuperate the physical strength needed to carry on the many activities with which she is faced very shortly after childbirth.

In practice: surveillance of weight gain during pregnancy is a fundamental part of prenatal consultations. Surveillance of the weight of each pregnant woman enables us to take the most appropriate individual measures, given the woman's specific environment.

These findings may be analysed for **all** pregnant women within one region or country, and correlated with other factors so as to bring to light those risk factors entailed by insufficient weight gain during pregnancy, from a public health viewpoint, and thus determine the implementation of preventive measures more specifically aimed at women who cumulate these risks.

3. MOTHER'S AGE, NUMBER OF CHILDREN AND INTERBIRTH INTERVAL

The mother's age, the number of children and the interval between births are three essential factors, which directly affect the woman's health status and that of her children.

Effect of the number of children

On the mother: the maternal mortality rate rises with the number of pregnancies, since complications tend to be more frequent (haemorrhaging, pulmonary embolism, anaemia, abnormal presentation of the foetus, uterine rupture, etc.), during pregnancy and delivery after the third pregnancy.

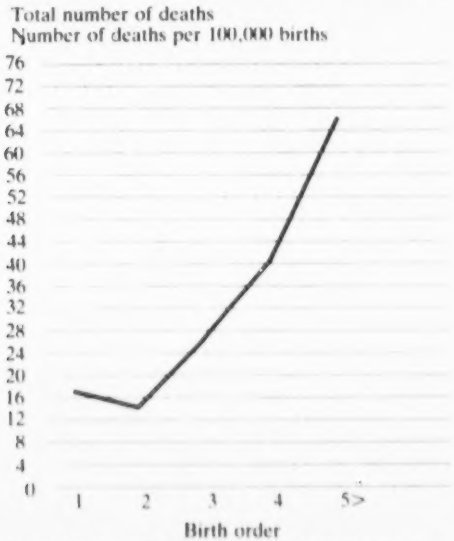
This is true, to varying extents, in developed countries such as Great Britain and in developing countries such as Bangladesh (fig. 7 and 8). If women in Bangladesh had no more than three children, it has been calculated that the maternal mortality rate would decrease by 30 %.

Maternal death is the ultimate consequence, but maternal illness also increases with the number of pregnancies.

On the child: the findings on the effect of parity on infantile mortality are contradictory. In Pakistan, for instance, there is evidence that children ranking third or fourth have a lower mortality rate (table 9), whereas other studies find an increase in the mortality rate as parity increases (fig. 9).

Figure 7

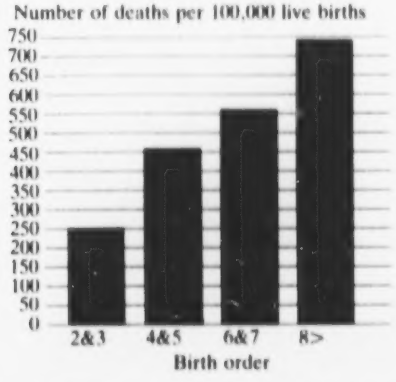
Number of maternal deaths correlated with birth order in England and Walles (1973-1975)



Taken from : Le planning familial : son effet sur la santé de la femme et de l'enfant. Centre for Population an Family Health. Columbia University Medical School, New York. 1981.

Figure 8

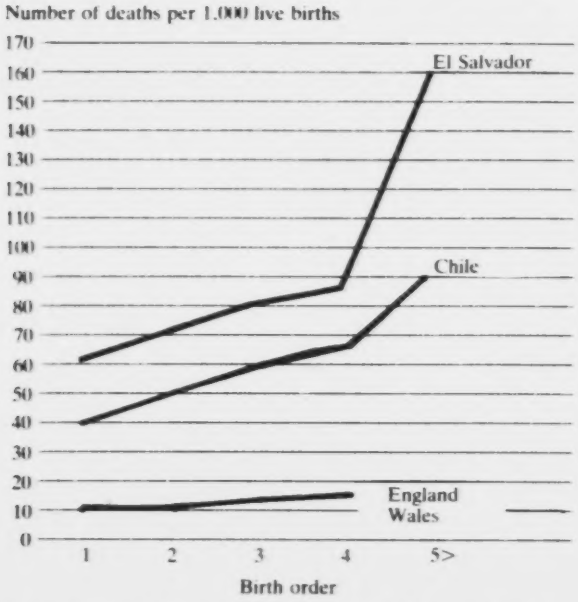
Maternal mortality correlated with birth order
Matlab (Bangladesh), 1968-1970



Taken from : Le planning familial : son effet sur la santé de la femme et de l'enfant. Op. Cit.

Figure 9

Number of infant deaths as correlated with birth order in El Salvador and Chile (1968-1970) and in England and Wales (1977)



Taken from : Le planning familial : son effet sur la santé de la femme et de l'enfant. Op. Cit.

This may be partly explained by the percentage of low birth weights (under 2,500 g), which is lowest for the third child in countries as different as India and the USA (1,2).

Table 9

Infant mortality rate by birth order in Pakistan

Birth order	1	2	3	4	5	6	7 and +
Infant mortality rate	142	109	102	99	104	118	136

Source : SATHAR Z.A. Infant and child mortality in Pakistan. Some trends and differentials. J.Biosoc. Sci. 1985, 17 : 351-359.

(1) R. CHAKRABORTY et al. Proportion of low birth weight infants in an Indian population and its relationship with maternal age and parity. Human heredity. 1975,2 : 73-160.

(2) S. SELVIN et al. The relationship between parental age and birth order with the percentage of low-birth weight infants. Human biology. 1972,44 : 3 : 501-510.

Effect of mother's age. Pregnancy during adolescence is a particular occurrence, and will be discussed in a separate paragraph (cf. paragraph 7).

On the mother's health: the maternal mortality rate is lowest for the 20 to 30 year-old group regardless of the country's developmental status. The risk of dying as a result of pregnancy is five times higher for women over 40 than for those aged 20 to 24 years.

The evolution of this figure shows that even when the maternal mortality rate declines in a country, the tendency for older expectant mothers to die more often persists.

"It is estimated that if childbearing was limited to women aged 20 to 34, the maternity-linked mortality rate would decrease by one fifth in Mexico, Thailand and Venezuela. It would decrease by about one fourth in Columbia and the Philippines (1).

On the child: the mortality rate for infants and children aged 1 to 5 years are at their lowest for mothers aged 25 to 29 years, regardless of the country's developmental status. They are highest for very young mothers and for those over 35 years old.

This higher infantile mortality rate at both ends of women's childbearing years is mostly generated by a high neonatal mortality rate (table 10), that is, the mortality during the first months of the child's life, when the child's health status is a direct consequence of the mother's health and of the delivery situation.

Table 10

Infant and child mortality by age of mother in Pakistan (‰)

Mother's age (years)	Mortality		
	neonatal	infant	1 - 5 years
Under 20	109	161	47
20 - 24	71	114	41
25 - 34	66	107	48
35 or over	80	125	52

Taken from : Z.A. SATHAR. Infant and child mortality in Pakistan. Some trends and differentials. J. Biosoc. Sci. 1985, 17 : 351-359.

The rate of malformations (cardial, mongolism, harelip, etc.) is much higher in the offspring of women over 35-40 years old.

Figures 10 and 11 show the percentages of low birth weight babies in New York and Calcutta in relation to parity and the mother's age. Both show a similar progression: for the youngest mothers (aged 20 to 29), the prevalence of low birth weight is lowest for the second and third children, but increases quite rapidly after the third child.

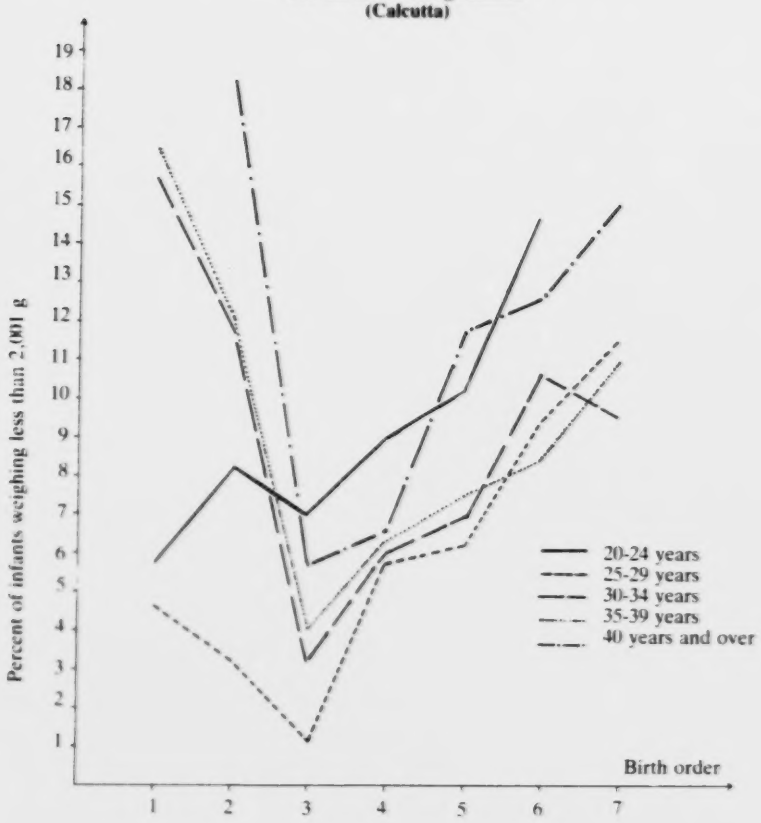
(1) D. MAINE. Le planning familial, son effet sur la santé de la femme et de l'enfant. 1981. Centre for population and family health. Columbia University, New-York.

For older women, over 30, the prevalence is high for the first child, then decreases for the second and third children of Indian women and even for the fourth or fifth child of New York women, then increases again.

The trend is the same for women over 40, but the prevalence of low-birth-weight is even higher.

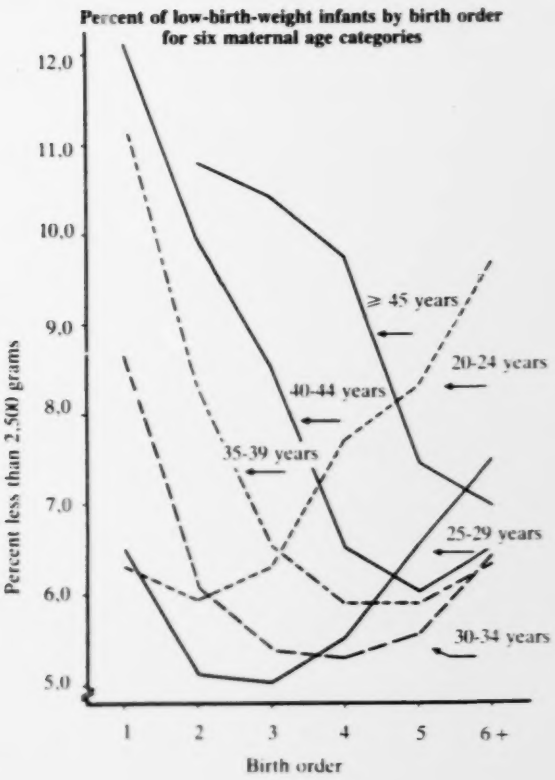
Figure 10

Percent of low-birth-weight infants by birth order for six maternal age classes (Calcutta)



Taken from : R. CHAKRABORTY, M. ROY, S.R. DAS. Proportion of low-birth-weight infants in an Indian population and its relationship with maternal age and parity. Human heredity. 1975, vol. 25, n° 2 : 73-79.

Figure 11



Taken from : S. SELVIN, J. GARFINKEL. The relationship between parental age and birth order with the percentage of low-birth-weight infants. Human biology. 1972, vol. 44, n° 3 - 501-510.

In Scotland (1), the evolution of perinatal mortality (between the 28th week of pregnancy and 28 days after birth) between 1960 and 1981-82 shows that it has decreased as living conditions and prenatal and delivery surveillance improved, but the risk is still higher for very young women (under 20) and for the oldest group (over 35), regardless of parity or social class.

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(1) J.F. FORBES and R.M. PICKERING. Influence of maternal age, parity and social class on perinatal mortality in Scotland, 1960-1982. J. Biosoc. Sci. 1985, 17 : 339-349.

Malnutrition is more frequent among children with a high birth order. In Colombia, in the city of Candelaria, J.S. WRAY and A. AGUIRRE have shown the critical figure to be four children.

Effect of interbirth interval

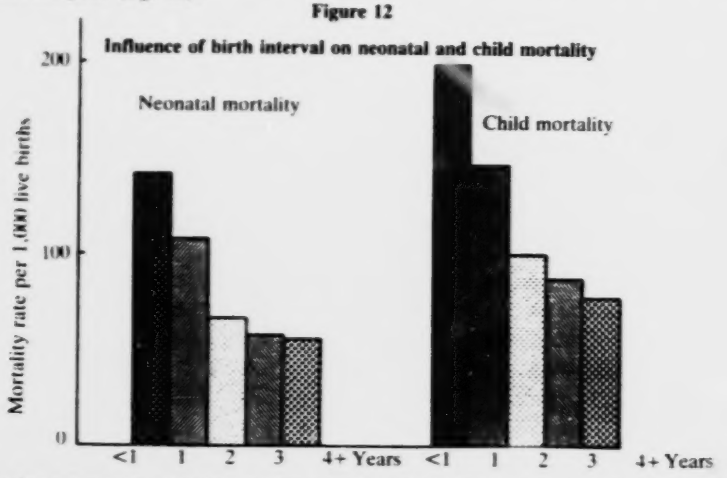
The interbirth interval is linked with the use of contraceptive methods, and in those societies where they are not habitually used, with breast-feeding as well as with a number of customs regulating sexual activity during the post partum period.

On the mother: almost nothing is known about the effects of various intervals between pregnancies on women's health. Theoretically, an uninterrupted succession of periods of pregnancy and lactation in women whose dietary intake is insufficient leads to malnutrition, one particular consequence of which is loss of weight. The few studies available do not corroborate this hypothesis clearly, but further research is required in this field. Little is known of the metabolic adjustments to low nutritional intakes.

On the child: we know more about the effects of the interbirth interval on the health of neonates and children. Broad investigations have been done on all continents, and all agree that infant mortality increases when the interval between births diminishes. Although other factors must be taken into account in the interpretation of these findings (mother's age, parity, prematurity possible, death of the previous child), all studies point in the same direction.

Infant mortality, but also child mortality (1) in many cases, rises when the interval between births is shorter than two years, and is considerably increased when this interval is shorter than one year (fig. 12).

Figure 12



Interval since last pregnancy = the interval between the end of last pregnancy and the birth of this child

Taken from : A.R. OMRAN and C.C. STANLEY (Eds.). Family formation and health. WHO. Geneva. 1976. p. 215. (findings of a survey or 6,541 women in Southern India, 1971-1975).

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(1) Annual number of deaths of children aged one to four years in relation to the total number of children in that age group, in the middle of the year, multiplied by one thousand.

Several causes are undoubtedly conjugated in the explanation of this phenomenon: biological causes, owing to the exhaustion of the maternal organism, and other causes more closely related to the mother's behaviour when faced with the problem of providing care for several children of similar age. Our present knowledge does not enable us to quantify the respective influence of these two factors, which most certainly varies from one group to another.

A short interbirth interval not only affects the second-born child, but the first-born child as well. Indeed, when a second pregnancy occurs, the mother completely stops breast-feeding, and the sudden weaning which ensues results in malnutrition, and sometimes even in the death of the child. This is the origin of the word "kwashiorkor", which has been adopted to designate protein-calorie malnutrition in which protein deficiency is predominant.

A study done in Pakistan shows that when the first-born child died before the age of two years, infant mortality was much higher and the effect of the interbirth interval persisted (fig. 13).

Figure 13

Infant and child mortality rates by length of preceding birth interval and survival status of previous child

Length of interval between previous and index child (years)	Survival status of previous child	
	Survived	Did not survive 2 years
Infant mortality		
< 2	124	307
2 - 3	92	207
3 - 4	47	254
4 +	64	145
1 - 5 years		
< 2	35	40
2 - 3	31	51
3 - 4	42	19
4 +	39	15

Source : Journal of Biosocial Science. July 1985, 17 ; 3.

While childhood deaths are more frequent when the mother has had a great many children, and at short interbirth intervals, the child's health status and more particularly his/her nutritional status is also influenced by these factors. Several studies have shown that when the interval between pregnancies is short, the children have a less satisfactory nutritional status.

In Candelaria (1), the percentage of malnutrition rises with the number of pre-school age children in the family.

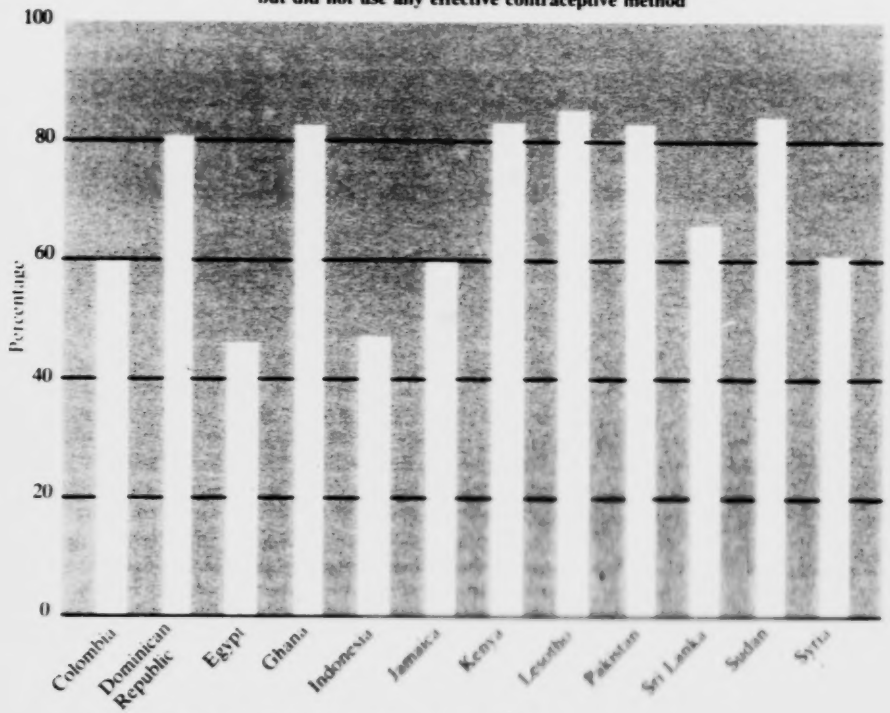
Tremendous numbers of women are affected by this problem of an interbirth interval too short to be compatible with satisfactory health for themselves and their children. Various reports indicate that 22 % of women in Bangladesh and Nepal, 28 % of those in Sri Lanka, 31 % in Malaya, 39 % in Jamaica and Colombia and 48 % in the Dominican Republic give birth to two children within less than two years.

And yet, the worldwide investigation of fertility showed that an average of 40 % of married women in twelve African, Asian and American countries did not want any more children (the figures ranged from 12 % in Ghana to 61 % in Colombia), and the proportion is even higher among women aged 30 to 34 years old.

Nevertheless, 46 to 85 % of these women (fig. 14) do not use any effective contraceptive method. The factors which contribute to this behaviour are the women's lack of

Figure 14

Percentage of women who claimed not to desire any more children but did not use any effective contraceptive method



Taken from : Review PEUPLES. Volume 12, N° 2. 1985

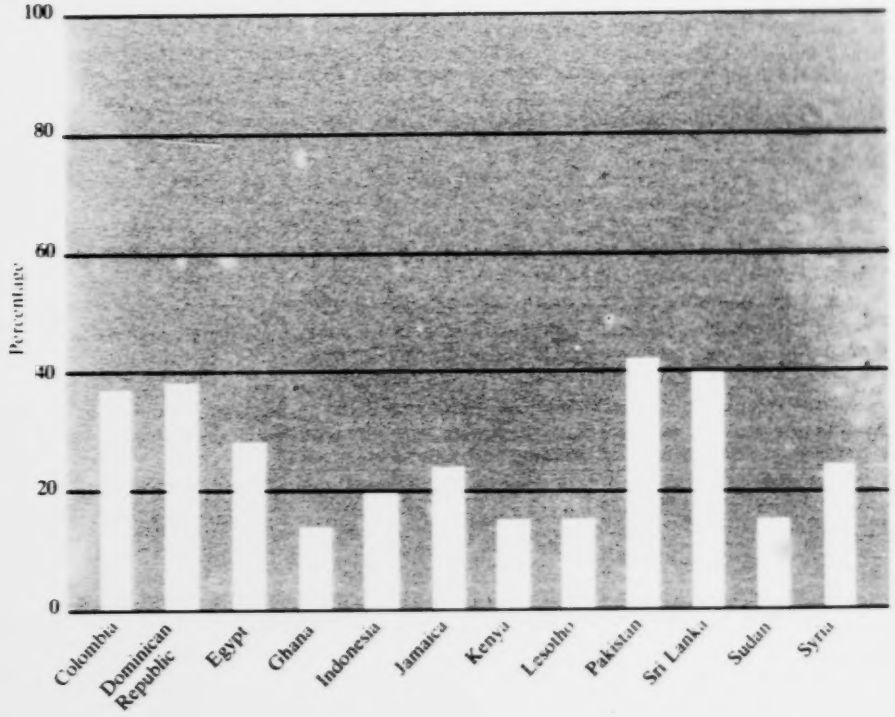
(1) J.D. WRAY and A. AGUIRRE. Protein caloric malnutrition in Candelaria, Colombia. Prevalence, social and demographic causal factors. J. of Trop. Ped. 1969, 15 ; 3 : 76-98.

information and their low educational level, since better-educated women tend to use contraception more often. To these we may add distance from a health centre, particularly in rural areas, as well as sociocultural factors, which vary with the country or region, and the fact that health workers may not have the time, the motivation or even the competency to deal with such matters.

If those women who do not want any more children and who do not use any efficient contraceptive method actually did not have any more children, it is estimated that the maternal mortality rate in those 12 developing countries (fig. 15) would be lowered by 24 % on the average.

Figure 15

Percentage of maternal deaths which would be avoided if women who did not desire any more children (and did not use any effective contraceptive method) did not have any more children



Taken from : Review PEUPLES. Volume 12, N° 2. 1985.

In practice

It is essential that the mother's age, the number of prior pregnancies and the date of the last delivery be noted during the first prenatal consultation. These three parameters have a tremendous influence on the health status of the mother and the child: pregnancies in women under 20 or over 35, in women with more than 4 or 5 children or who are pregnant for the first time (primiparas), and in those who have given birth to two children in less than two years all present a greater risk than the others.

At the **individual** level, whenever a woman shows one or more of these characteristics, she should be given regular, thorough surveillance throughout her pregnancy, in order to detect the slightest anomaly, to correct it as soon as possible and to plan for the presence of competent pesonnel during her delivery.

At the **collective** level, the data collected at the local level should include the outcome of all pregnancies (health status of mother and child). They should be transmitted to the regional and national agencies for analysis, and will contribute to a more accurate definition of the specific at-risk groups within the community, thus facilitating the implementation of appropriate preventive measures. These aim at:

— delaying the first pregnancy and avoiding late pregnancy, by education and information on sexual matters, and legislation on marital age, etc.
— avoiding excessively large families, by programmes aimed at reducing childhood deaths, for instance, the education of men and women, etc.
— avoiding pregnancies at short intervals by education, for example, the popularization of planned parenthood methods, etc.

4. MATERNAL NUTRITIONAL STATUS, BREAST-FEEDING AND INTERBIRTH INTERVAL

Mother's milk is the best food for an infant (cf. n° 138/139/140 of this journal). A great many countries have initiated programmes for the promotion of breast-feeding, in order to combat the tendency to abandon it in the developing countries, and to favour and pursue the tendency to augment it in the industrialized countries.

There is now some understanding of the influence of the mother's nutritional status on the quantity and quality of her milk. Almost nothing is known, on the other hand, of the effects of breast-feeding on the woman's own nutritional status and health.

4.1. Nutritional status of the lactating woman - Quantity and quality of the breast milk

The frequency and duration of feedings as well as the energy with which the infant suckles the nipple all contribute to the production of milk, through reflex mechanisms regulated by various hormones.

A healthy woman who feeds her child upon request, under satisfactory psychological conditions, and has a vigorous, well-nourished child, produces an average of 700 to 850 cc of mature milk a day. When breast-feeding is prolonged, she may produce similar amounts for 12 months, after which the quantity declines.

The amount of milk produced also depends on the lactating woman's nutritional status: when her weight gain during pregnancy is low, she does not build up the fatty reserves required for the extra energy expenditure involved in breast-feeding. The amount of milk then depends on the mother's dietary intake and on her overall energy expenditures: often women resume all of their previous activities soon after delivery.

Studies done by H.L. VIS and Ph. HENNART in the Kivu region of Zaire show the influence of these different factors: the average weight gain during pregnancy is 2 to 3 kg in rural areas. It increases during the season when more food is available. Milk production depends on the agricultural cycle: after the bean harvest it averages 611 g/day, as against only 390 g/day between the two annual harvests.

In this region, urban lactating women are taller and weigh more than rural women, and they produce larger amounts of milk (table 11) (1).

Table 11

Amount of milk produced by urban and rural women in Kivu (Zaire)

	Rural area	Urban area
Weight	52.1 ± 0.7	55.9 ± 1.6
Height	151.2 ± 0.7	154.0 ± 1.1
Amount of milk (g/24 h)	543 ± 24	659 ± 38

HENNART has demonstrated that the relative protein-energy malnutrition of lactating mothers, and particularly its protein component (assessed by the serum albumin level) limited the amount of milk secreted at each feeding in this area.

Table 12 shows that the difference in milk production between women living in privileged settings (Sweden) and those living in communities where malnutrition constitutes a public health problem (Mexico) is evident at least during the first six months of the infant's life.

Table 12

Milk production in well-nourished and malnourished women

Weeks post partum	Mexico (cc)	Weeks post partum	Sweden (cc)
2	423	1	558
8	577	4	724
16	437	10	752
24	561	20	756

Taken from : VEGA FRANCO L. Maternal nutrition and growth of the suckling. Bull. of the Int. Ped. Ass. 1985, 6 ; 1 : 20-25.

(1) H.L. VIS and Ph. HENNART. L'allaitement en zone rurale pauvre au Kivu. Assignment Children. UNICEF 1981. 55/56 : 171-189.

In Egypt, M.M. HANAFY has studied the amount of milk secreted by well-nourished and poorly nourished women, and finds it to be 922 cc/day and 733 cc/day respectively.

During the dry season in Gambia, when the calorie intake averages 1,800 Kcal/day, the maternal milk production is somewhere around 790 cc/day at the beginning of lactation. During the wet season, when the intake is only 1,200 Kcal/day the production drops to 630 cc/day (1).

In India, women with a poor nutritional status were found to introduce complementary food earlier than the others. Their attitude was certainly not due to a lack of motivation. This suggested the hypothesis that their milk production was insufficient, and did not satisfy the child's needs. There is a question of whether severe nutritional anaemia caused by an iron deficiency may not influence milk production along with protein-energy malnutrition (2).

The composition of breast milk varies, depending on whether we consider the colostrum (0 to 5 days after delivery), transitional milk (until the 30th day) or mature milk (more than 30 days after delivery).

The mother's nutritional status hardly modifies this composition, however. Only the fat content of milk is lowered by maternal malnutrition; it is also somewhat altered by the mother's fat intake.

The composition of the fatty acids in the milk is influenced by the type of fatty acids contained in the mother's diet: the greater the proportion of nonsaturated fatty acids in her diet, the more nonsaturated fatty acids will be found in her milk.

Supplementation with some water-soluble vitamins may increase their presence in the milk of undernourished lactating women. These are: thiamine, riboflavin, vitamin B6, vitamin C, the folates, Vitamin B12. The vitamin A content of breast milk depends on the mother's reserves and on her intake.

Little research has been done on the variations in the trace elements in milk with the intake and nutritional status of the mother. The amounts of protein, lactose and minerals, on the other hand, remain constant regardless of the mother's nutritional status and her intake.

Table 13

Composition of mother's milk according to research by Jelliffe and Jelliffe

Nutrients	Well-nourished women	Poorly nourished women
Lipids (g/dl)	4.2 - 4.8	2.8 - 4.2
Lactose (g/dl)	6.8 - 7.4	6.5 - 7.5
Proteins (g/dl)	1.1 - 1.3	1.0 - 1.5

Taken from : D.B. JELLIFFE and P. JELLIFFE. The volume and composition of human milk in poorly nourished communities. A review. Am. J. Clin. Nutr. 1978, 31 : 492-515.

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(1) G.A. GLUGSTON. Lactation. Its process and outcomes and the effect of maternal nutrition. Document presented to the WHO work group on breast-feeding. October 1982. Shanghai.

(2) C. GOPALAN. Infant nutrition in West Bengal. Insights from recent studies. NFI Bulletin. 1985,6 : 2.

4.2. Breast-feeding and spacing of births

The interval between one birth and the beginning of another pregnancy depends on the resumption of the woman's ovarian cycle, physiologically speaking, and on the woman and the couple's desire to have another child, and their knowledge of and access to means of contraception, on the psychological and environmental level.

When the woman does not breast-feed, menstruation resumes four to six weeks post partum, after a first, generally anovular cycle.

When the woman lactates, the persistence of a high level of prolactin (1), influenced by the number and frequency of feedings, extends the duration of post partum amenorrhoea by inhibiting ovulation. The nonfertile period is thus prolonged.

Statistically, the longer the breast-feeding period, the longer post partum amenorrhoea lasts (table 14).

Table 14

Estimated mean durations (months) of breast-feeding and post partum amenorrhoea in three states in the Brazilian Nordeste

	Bahia	Paraïba	Rio Grande do Norte
Breast-feeding	8.1	5.3	5
Post partum amenorrhoea	4.6	3.6	2.9

Taken from : ANDERSON et al. Analysis of breast-feeding in North-Eastern Brazil. Studies in family planning. 1984, 14 : 8/9 : 210-218.

While this relationship clearly exists **on the average** within a population of women, and contributes to lengthening the interval between births within a community, the contraceptive effect of breast-feeding for any individual woman is much too uncertain to be recommended. Other methods must be employed.

Many traditional societies enforce sexual abstinence during the entire breast-feeding period, thus increasing the interval between births. Rapid urban development and "cosmopolitan culture" tend to eliminate this custom.

It is increasingly clear that delayed ovulation is also correlated with the nutritional status of the lactating woman, and that the persistence of a state of chronic undernourishment in the mother delays the resumption of menstruation.

The alternation of periods of gestation and lactation in women of childbearing age, with no time to build up new reserves despite ongoing intense physical activity connected with their role in society during these periods, constitutes a tremendous drain on most of the nutrients essential to the body's functioning. This maintains mothers in a state of chronic malnutrition.

(1) A pituitary hormone stimulating the secretion of milk by the mammary gland.

Several studies have shown that improvement of mothers' diet during pregnancy and/or lactation tends to reduce the average duration of post partum amenorrhoea, thus possibly increasing the birth rate, in the absence of effective birth control measures.

In practice

Human milk is the most appropriate food for infants. Prenatal visits should prepare the mother for breast-feeding, by making sure that she builds up proper reserves, in particular, so that breast-feeding will be as satisfactory as possible. The reserves may be evaluated by charting weight gain.

Nutrition education for mothers should be pursued during post-natal visits, so that their nutritional status will enable them to secrete sufficient amounts of milk. Consultations during the post-natal period should be opportunities to discuss the issue of contraception with the woman and her partner. Indeed, breast-feeding should not be counted upon as a contraceptive method.

5. ANAEMIA

Throughout the world, the main cause of anaemia is nutritional deficiency, particularly of iron, but also of folates. Because of their menstrual losses, women of childbearing age constitute the main population group (along with pre-school age children and even school age) affected by iron deficiency.

According to WHO (1), in 1979, about half of all non-pregnant women of childbearing age in the developing countries had a haemoglobin count of less than 12 mg/dl, which figure defines anaemia. These estimations find 58 % of women to be anaemic in Asia, 40 % in Africa and 17 % in Latin America. In the developed countries, the figures are about 4 to 7 % in Europe and 6 % in the USA.

The prevalence of nutritional anaemia is much greater still in pregnant and lactating women, since their requirements are much higher during these periods: the mother must draw from her reserves, often depleted by previous pregnancies, to increase the mass of red blood cells and cover the needs of the foetus and the placenta. Her requirements are therefore six times as high as those of a non-pregnant woman.

Table 15 shows the prevalence of anaemia in pregnant women near term, in some countries (Anaemia is defined as a haemoglobin level under 11 g/dl).

The low absorbability of the iron (2) contained in traditional food, mostly plants, which are the dietary staples of these populations, along with the various types of parasitosis and the very high requirements of this group of women explain the extremely high prevalence.

Repeated pregnancies followed by periods of breast-feeding do not leave time for women to reconstitute sufficient hepatic iron reserves in order to cope with another pregnancy. The prevalence of iron-deficient anaemia therefore rises with parity. In Thai-

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(1) WHO. The prevalence of nutritional anaemia in women in developing countries. WHO Division of Family Health. 1979. Geneva.

(2) The absorbability of iron contained in food is defined as the percentage of iron actually absorbed by the intestinal mucosa. It ranges from 1 to 5 % for plant foods and from 10 to 22 % for animal foods. The absorbability of the iron contained in plants is improved by the simultaneous intake of vitamin C or animal foods.

land, it has been shown to double after the third pregnancy, and to be multiplied by five after the fifth.

Table 15

Prevalence of anaemia in women in the third trimester of pregnancy

Geographical area	Population	Anemic (%)	Year
Latin America	mixed	26.5	1968
Mexico	rural	26.6	1971
Venezuela	urban	37	1968
Israel	rural	47	1968
Southern India	mainly urban	57.4	1968
Northern India	rural	80	1968
Burma	urban	82	1976
Tunisia (1)	mixed	38	1978
Ivory Coast (1)	mixed	34	1978
Ghana (1)	mixed	64	1970

Taken from : BAKER and DEMAEYER. Nutritional anaemia : its understanding and control with special reference to the work of the WHO. Am. J. Clin. Nutr. 1979, 32 : 368-417.

Iron-deficient anaemia is particularly frequent in pregnant adolescents, since their growth requirements are added to the requirements inherent in pregnancy.

Both mother and child suffer from the consequences of this anaemia.

The mother: anaemia is known to induce dyspnea during effort, tachycardia, dizziness, fatigue and fainting. Several studies of labourers in Guatemala, Indonesia and Sri Lanka have shown that anaemic workers have less resistance and a lower productivity than non-anaemic workers.

Studies of anaemic children have shown them to be more prone to infections, particularly of a respiratory nature, than other children.

Maternal mortality and morbidity are also increased in case of nutritional anaemia. The maternal mortality rate in Kuala Lumpur (Malaysia) between 1953 and 1964 was 1,550 per 100,000 in women with severe anaemia, as against 350 per 100,000 in non-anaemic women.

The child: severe anaemia generates an increased risk of prematurity and perinatal and neonatal mortality (table 16).

(1) WHO. The prevalence of nutritional anaemia in women in developing countries. WHO Division of Family Health. 1979. Geneva.

Table 16

Variation of several parameters in infants with relation to the degree of maternal anaemia

	Maternal haemoglobin		
	Under 7.5 g/dl	Between 7.5 and 8.8 g/dl	Over 8.8 g/dl
Premature births (%)	42.0	32.0	12.7
Stillbirths per 1,000 births	147.1	150.0	51.0
Neonatal deaths per 1,000 live births	50	29	21.5
Birth weight	2,608 g	2,948 g	3,033 g

Taken from : W. MAC GREGOR. Maternal anaemia as a factor in prematurity and perinatal mortality. Scot. Med. J. 1963, 8 : 134-140.

In addition, the foetal iron reserves also seem to be decreased when the mother is anaemic (1,2).

6. WORK AND WOMEN'S HEALTH

Women in rural and urban areas of developing countries are obliged to do much hard, tiring work (cf. n° 146 of this journal). Their job within the family involves caring for the children, various agricultural tasks, particularly those involved in growing the family's staples (sowing, hoeing, weeding, harvesting and transportation), food preparation fetching water and wood, household chores, etc.

As their men migrate to the cities, farming regions or foreign countries, rural women tend to become de facto heads of household, and are therefore responsible for the family's survival; this further increases their work load.

An increasing number of women in cities are also heads of household, particularly in Latin America, and must provide for their children's subsistence. Often these city women find underpaid jobs in factories where the work is repetitive and demanding, requiring accuracy, efficiency and dexterity, while exposing them to all sorts of pollution and noise.

An even greater number of these women find no work at all, and must resort to occasional employment on the informal work market (selling food on the streets, crafts, laundering, servant, poorly paid work at home). Others are forced into prostitution.

Table 20 shows the comparative "time budget" of Ivory Coast men and women working in agriculture. While women do less heavy work (clearing land, slaughtering), they have less time for rest and social activities, and their total, effective working time is longer. They perform two thirds of all household chores and more than half of the work involved in feeding the family.

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(1) G. TCHERNIA, I. BLOT. Carence maternelle en fer et folates. Répercussions sur le nouveau-né. Ann. Pediat. 1982. 29 ; 4 : 276-280.

(2) V. FENTON, I. CALVILL and J. FISHER. Iron stores in pregnancy. Br. J. Haematol. 1977, 37 : 145-149.

Girls contribute to this work from early childhood on. Their activities do not cease during pregnancy, and resume immediately after childbirth.

These physical activities, combined with the heavy toll taken by numerous pregnancies and periods of breast-feeding, affect the physical and mental health and nutritional status of third world women and of their children.

In Ethiopia, pregnant women with an energy intake of less than 70 % of the amounts recommended by FAO/WHO and an equally insufficient protein intake have been shown to give birth to infants with a lower birth weight when they did hard physical labour than when they did light work only (3,068 g as against 3,270 g).

Table 17

Time budget of 20 to 49 year-old Ivory Coast men and women working in agriculture.
Hours, minutes and percentage of the average day, for moderately active individuals

Activities grouped together	Men			Women		
	h.	min.	%	h.	min.	%
Rest	5	41	23.7	4	43	19.7
Travel	1	9	4.8		53	3.7
Social activities	1	56	8		48	3.3
Household chores		47	3.3	2	1	8.4
Fetching water and wood		7	0.5	1	9	4.8
Shopping		3	0.2		32	2.2
Cooking		—	—	2	18	9.6
Eating	1	3	4.4	1	4	4.5
Food-gathering, hunting, fishing		25	1.7		11	0.8
Slaughtering		13	0.9		—	—
Burning and clearing land	1	31	6.3		10	0.7
Tilling		52	3.6		43	3.0
Harvesting		48	3.4		30	2.1
Processing of products		12	0.8		20	1.4
Other agricultural activities		24	1.6		10	0.7
Small trade		7	0.5		4	0.3
Total waking time	15	18	63.7	15	36	65.2
Sleep	8	42	36.3	8	24	34.8

Taken from : P.J. FRANCOIS, J.L. DUBOIS, YAI. Dépense énergétique et budget temps : un indice d'activités fondé sur des données collectées en Côte d'Ivoire. Alimentation et nutrition. 1983 ; 9, 1 : 31-39.

In the USA (1), the birth weight of full-term infants is lower when the mother did work requiring a standing position beyond the 28th week of pregnancy or had to care for other children.

Subsequently, the mother's work outside the home may constitute an obstacle to adequate breast-feeding, since mother and child may be separated. The result is a decreased number of feedings, leading to reduced secretion of milk (cf. paragraph 4).

Although most women work in situations to which no labour legislation applies, the minority who are legally entitled to and are actually given maternity leaves generally uses these to take some other employment, often performing hard labour, in order to increase the family income.

7. PREGNANCY IN ADOLESCENTS

WHO defines adolescence as a period during which:

- the individual moves from the phase of development of secondary sex characteristics to that of sexual maturity;
- he/she acquires those psychological structures and modes of identification which transform the child into an adult;
- a transition occurs between complete social and economic dependency and relative independence.

The age at which puberty occurs is correlated with the girl's nutritional status. Even within a given ethnic group, girls with a better nutritional status tend to experience puberty earlier.

In Kenya (2), rural 10 to 13 year-old girls were found to be 10 to 15 cm shorter and 9 to 14 kg lighter than their urban counterparts, some of whom came from a socio-economically privileged background. In the former group, the age at first menstruation was more than 2 years higher than in the latter: 15.3 ± 2 years as against 13.2 ± 1.5 years. A similar difference is observed between well and poorly nourished girls in the USA: 14.45 years as against 12.43 years (3).

In Bangladesh (4), a study of girls of the same age showed that those who had suffered from the famines between 1971 and 1975 had their puberty delayed by one year. The findings are similar throughout the world: undernourished girls begin to menstruate at a later age.

The physical, emotional and social consequences of pregnancy in an adolescent may be devastating, when the social and sanitary environment is unsatisfactory, and particularly so in younger girls.

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(1) R.L. NAEYE et al. Working during pregnancy : effects on the fœtus. Pediatrics. 1982, 69 ; 6 724-727.

(2) KULIN et al. The effects of chronic childhood malnutrition on pubertal growth and development. Am. J. Clin. Nutr. 1982, 36 ; 527-536.

(3) DREIZEN et al. A comparison of skeletal growth and maturation in undernourished and well nourished girls before and after menarche. J. Pediatr. 1967, 70 ; 2 : 256-263.

(4) A. CHOWDURY et al. Malnutrition, menarche and marriage in rural Bangladesh. Soc. Biol. 1977, 24 ; 4 : 316-325.

Physically speaking, pregnancy occurs at a time when the girl herself is still growing. Although growth slows down at menarche, after a pubertal peak, it does continue for 4 to 7 years. The adult height and weight of healthy women are 4.3 to 10.6 cm and 5 to 10 kg higher than they were at puberty. Menstruating girls therefore have high nutritional requirements, particularly during the first two years of menstruation. In addition, their reserves are depleted, since they have just experienced a peak growth rate.

The intrauterine growth of her child further increases the adolescent's nutritional requirements, as does the breast-feeding period immediately following delivery. The risks involved in adolescent pregnancies affect both mother and child.

The mother: as at the other end of the fertile period, maternal mortality is higher before age 20 than during the period between ages 20 and 30 (table 18). In the Matlab region (Bangladesh), nearly six out of 10 deaths in 15 to 19 year-old girls are linked with pregnancy.

The maternal disease rate is also high at these ages: the main gestational complications are severe anaemia, renal complications, along with a higher frequency of gravidic toxaemia, eclampsia and pre-eclampsia and complications during labour (1), requiring more frequent recourse to forceps or caesarean section.

Table 18

Maternal mortality (per 100,000 live births) with reference to mother's age in some countries

Mother's age	USA 1974	Thailand 1971	Matlab Thana Bangladesh 1968-1970
Under 19	11	204	860
20 - 24 years	10	154	380
25 - 29 years	13	154	520
30 - 34 years	24	209	620
35 - 39 years	41	275	480
40 - 44 years	86	474	810
45 and over	234	?	?
All ages	15	210	570

Taken from : Population Reports. Serie J, N° 14. 1977, p. 3.

As a rule, studies consider adolescents under 20 as a group, although it seems that all complications increase in frequency when the girl is younger.

Girls under 16 who have given birth practically stop growing, even if their diet is satisfactory. This may be due to intensified bone calcification, generated by the oestrogens secreted during pregnancy.

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(1) In some parts of Africa these often include difficulty in expulsion due to a scarred perineum produced by ritual excision.

When girls are married very young, between the ages of 8 and 12, as is customary in some African and Asian cultures, difficulties in childbirth often lead to the development of vesicovaginal or rectovaginal fistulas, leaving these girls incontinent. This may be a cause of rejection by their husband and their cultural group.

According to DESCHAMPS (1), however, "pregnancy and childbirth are far less hazardous for adolescents from well-to-do families than for those from poor families... The frequency of serious complications attendant to juvenile pregnancies is not so much due to any physiological or psychological specificity of adolescent girls as to the almost constant poor quality of their prenatal medical surveillance... We are only speaking of physical complications".

The psychological and social consequences of such pregnancies depend upon their acceptance by their family and community. In many cultures, unmarried pregnant girls feel ashamed and guilty, and hide their condition from their family and society as long as possible, for fear of their incomprehension and rejection.

In many countries, a pregnant girl is still obliged to leave school, with all the effects this will have on her future. An increasing number therefore hide their pregnancy and seek an abortion, often at a late date, with all of the attendant risks (cf. paragraph 8); others may even abandon their child at birth.

Traditional African (2) and Latin American cultures often view children as a blessing; pregnant adolescents are given sollicitous care by their family during their pregnancy and delivery, regardless of whether or not they are married: no special psychological or emotional problem then arises.

With increasing urban development, socio-economic difficulties and schooling for girls, this traditional attitude tends to disappear, however. Families increasingly banish such girls from their home.

The emotional and social well-being of these girls is then seriously threatened possibly leading to suicide and in any case to inadequate surveillance of their pregnancy, with all of the consequences implied by this.

The child: prematurity and low birth weight are far more frequent in the offspring of adolescent mothers.

In France, LEROY (3) found a 15 % prematurity rate for adolescents over 15 years old, and a 24 % rate for those under 15, as compared to 8 to 10 % in the population as a whole. This risk increases with the number of pregnancies occurring before age 20.

In the USA (4), 11 % of first-born babies, 27 % of the second-born and 43 % of the third-born are premature when the mother is under 18 years old.

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(1) J.P. DESCHAMPS. Grossesse et maternité chez l'adolescente. Socioguides. 1976. 239 p.

(2) J. MBEDE. Le pédiatre et la santé des adolescents. Grossesse et adolescence en Afrique. Paper delivered at the 25 April 1985 Seminar.

(3) J.L. LEROY et al. La gravido-puerpéralité chez les adolescentes. Gazette médicale de France. 1974, 81 : 2,427-2,436.

(4) J.F. JEKEL et al. A comparison of the index of health and subsequent babies born to school age mothers. Amer. J. Publ. Health. Quoted by J.P. DESCHAMPS in Grossesse et maternité chez les adolescentes, p. 111.

In Latin America (1), the prematurity rate (gestational age 36 weeks or less) ranges from 13.3 to 40 % depending on the country, and 11.4 to 24.2 % of children weigh less than 2,500 g at birth when their mothers are adolescents.

At the Yaounde (Cameroon) maternity hospital, 11.6 to 12.4 % of children weigh less than 2,500 g at birth. At the Cotonou (Benin) maternity hospital the figure is 14.4 % for adult women. These percentages are much higher for adolescents (table 19).

Table 19

Age of adolescent mothers and percentage of low birth weight

Mother's age (years)	Yaounde (2)		Cotonou (3)		USA 1972
	No. of deliveries	Birth weight under 2,500 g	No. of deliveries	Birth weight under 2,500 g	Birth weight under 2,500 g (4)
12	—	—	2	50	
13	6	50	4	25	15.7
14	28	17.8	15	33.3	
15	141	19.8	88	27.3	
16	386	18.4	133	24.8	
17	710	20.7	310	23.2	10.2
18	912	16.2	753	24.8	
19	934	14.5	—	—	
Total	3,117	17.26	1,305	24.7	—

In India, B. DAS evaluates the number of low birth weight babies at 46.2 % of children born to adolescents under 20 years old who deliver in hospital.

Adolescents aged 13 to 16 with the same height as women aged 17 to 25 will give birth to lighter babies. If they gain the same amount of weight during pregnancy, their babies will nonetheless weigh less.

At the Lima, Peru maternity hospital (5), it has been shown that if a woman is to give birth to a child weighing 3,220 g, she must gain about 16 kg during pregnancy if she is aged 13 to 15, 11.5 kg if she is 16, and 10 kg if she is over 17.

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(1) B.J. SCHMIDT et al. Le pédiatre et la santé des adolescents. La grossesse chez les adolescentes en Amérique Latine. Paper delivered at the 25 April 1985 Seminar.

(2) J. MBEDE. Op. cit.

(3) C. AVOHOU, Grossesse et accouchement chez l'adolescente. Thesis. 1980. Cotonou.

(4) Quoted by N. GUNTER et al. Maternal and perinatal effects of adolescent child bearing. Int. J. of Beh. Dev. 1981, 4 : 333-357.

(5) FRISANCHO et al. Maternal nutritional status and adolescent pregnancy outcome. Am. J. Clin. Nutr. 1983, 38 : 739-746.

The perinatal mortality rate is high for children of adolescent mothers: between 6.5 and 38.8 ‰ in Latin America, 73 ‰ in B. DAS's study in India. Infant mortality is equally high: 104 and 120 ‰ in Sao Paulo (Brazil) and El Salvador as against 53 to 68 ‰ and 73 to 84 ‰ respectively in women aged 20 to 34 years.

The same phenomenon occurs, to a lesser extent, in countries with a good health infrastructure such as the USA (cf. the PAHO survey of infant mortality in America) (table 20).

Table 20

Infant mortality rate for all mothers and for those under 20. 1973

	Infant mortality	
	All mothers	Mothers under 20
Argentina (Chaco)	80.1	133.5
Brazil (Sao Paulo)	65.1	104.1
Chile (Santiago)	55.2	79.3
Mexico (Monterrey)	60.7	86.3
USA (San Francisco)	17.5	26.2

Taken from : Population Report. J. 10. Aug. 1976, quoted by PUFFER and SERRANO.

Those surveys which differentiate girls under 16 from the others show the risk of infant mortality to be highest in the youngest girls.

MBEDE has also observed that in Cameroon (1), when a child born to an adolescent is cared for by the grandmother or great grandmother, early, severe cases of malnutrition are found to occur.

In the USA (2), sudden infant death is more frequent when the mother is an adolescent (when birth weight is comparable), while post-neonatal mortality caused by accidents, violence or infection is more frequent. However, this seems to be correlated with socio-economic level rather than with the mother's age. It was also noted that these children were usually small and light in weight when they reached school age, in comparison with children whose mothers were older.

Some more sociological explanations may help us to understand certain types of malnutrition in children whose mothers are young. In Brazzaville, Congo (3), a number of children hospitalized with kwashiorkor had a young, urban-dwelling, unmarried mother from a socio-economically privileged background. In the urban context, with its destructu-

(1) J. MBEDE. Op. cit.

(2) B.S. ZUCKERMAN. Adolescent pregnancy : biobehavioral determinants of outcome. The Journal of Pediatrics. Dec. 1984, 105 ; 6 : 857-863.

(3) M.E. GRUENAIS. Une approche sociologique des malnutritions graves à Brazzaville. Second International Congress of the GERM (Groupe d'Etudes et de Recherches sur la Malnutrition). 15-18 August 1985.

ration of the traditional family bonds, some families refuse to allow the mother to marry the father of her child, for a variety of reasons (financial, ethnic, to assert the authority of the head of the family). Both mother and father are then excluded from the traditional systems of solidarity and unable to provide for their child's needs, for lack of resources.

In conclusion, it should be emphasized that many factors other than age are at work in the occurrence of these complications. They include the woman's weight before pregnancy, her weight gain during pregnancy, smoking, socio-economic level, etc. It has been proved that satisfactory prenatal surveillance of adolescents aged 16 or more may eliminate the perinatal consequences of such pregnancies. This was not true for those aged 15 or less.

In practice

The serious consequences of pregnancies in adolescents show the need for action aimed at avoiding them.

Only long-term educational action covering the entire population, seconded by appropriate laws and respect of them, may modify traditional behaviour with respect to early marriage.

Contraceptive means should be made available to adolescents. If a pregnancy occurs, it should be classed in the high-risk category and strict follow-up provided, with the type of delivery defined in advance and performed by highly competent personnel.

8. ABORTION

Since many pregnancies are undesired, a multitude of women everywhere resort to induced abortion (1). The number of these is estimated at 30 to 55 million, throughout the world, and according to the International Planned Parenthood Federation 16 million abortions take place in 65 Asian, African and Latin American countries, most of them illegal.

When performed under proper sanitary conditions, by competent personnel, abortion is quite safe, as far as health is concerned. When it is illegal, on the other hand, (and this is the case for 60 % of the world's population), women are obliged to abort under poor conditions, and the resulting mortality, morbidity and long-term consequences are considerably greater.

Because it is illegal, accurate information on abortion is hard to obtain, and the available figures are only gross approximations. The figure of 68,000 to 84,000 deaths in women due to the aftermaths of illegal induced abortions throughout the world is suggested. Illegal abortion is thought to cause 30 % of all maternal mortality in Latin America.

The disease rate linked with illegal abortion is even higher: the illnesses caused are extremely varied, and depend on the method used, the conditions under which it is performed and the gestational age. Severe, immediate complications include haemorrhaging, shock, tetanus, sepsis, pelvic infection, perforation of the uterus, damage to the bladder and uterus.

The long-term consequences are sterility and other complications whose link with abortion is not formally proved: spontaneous miscarriage, prematurity, low-birth-weight, etc.

While it is difficult to determine the exact status of induced abortion throughout the world, studies in the developing countries show it to be more frequent in Asia and Latin

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(1) A deliberate attempt by the woman herself or any other person, in order to terminate pregnancy.

America than in the Middle East and Africa, with a rising rate of illegal abortions in some of these countries. Women who resort to abortion tend to be older and married, they already have children and live in the cities.

Africa is an exception to this rule, since many young, unwed, city-dwelling primiparas resort to abortion on that continent. This is of course only a general description of a tendency; women of all sorts resort to abortion.

In practice

There is no use in pretending ignorance: the truth is that women everywhere find a way to abort when their pregnancy is undesired. When strict laws make abortion illegal, they endanger the health of thousands of women, and beyond them, of thousands of children and families, for abortions are then performed under the worst conditions, often ending in death.

Every effort must be made by those who are aware of these facts, in order to avoid such catastrophes. Information on contraception must be improved, contraceptive methods made available to all couples and liberal laws adopted so that proper medicalization of this act may be organized.

Even then, abortion is no trifling act. Its psychological effects are deep, and may seriously affect many women, particularly younger ones. They should also be listened to, in order to avoid the development of guilt feelings: the family is often unable to fulfill this function.

9. THE GROWTH OF SMALL GIRLS AND ITS EFFECT ON FUTURE PREGNANCIES

Very little is known at present of the relations between the growth of girl children, starting in the intrauterine period, and their subsequent ability to bring pregnancies to a satisfactory term when they reach childbearing age.

Some preliminary research has been done in industrialized countries (England, USA), but none has been done in the developing countries.

Following a study of the century-long evolution of perinatal mortality and central nervous system malformations in Scotland, BAIRD (1) suggests that women born during periods of economic depression (such as the great depression of 1929) and of deteriorating environmental conditions, suffer from physiologically altered and anatomically retarded growth. This may explain the unexplained relatively high perinatal mortality rate among their children, when they reach adulthood. 30 % of perinatal deaths in Scotland in 1977 corresponded to unexplained low birth weight, while 27 % were linked with congenital malformations.

A comparison of the perinatal mortality rate of a country such as Sweden, where it is very low (around 9 ‰) and the Scottish rate, and a scrutiny of the causes of these deaths, led the author to the idea that one possible explanation of the difference resides in the fact that there are no regional nor social differences in the average height of Swedish girls. They are therefore able to fulfill their genetic potential for height growth.

Such differences still persist in Scotland, since underprivileged women do not encounter optimal conditions for growth. It is a recognized fact that living conditions during the early years (and especially nutrition and frequency of infections) affect adult height.

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(1) D. BAIRD. Environment and reproduction. Br. J. of Obst. and Gynaec. 1980, 87 ; 12 : 1.057-1.067.

Small adult height is a contributive factor to maternal mortality and the prevalence of low birth weight. In rural Guatemala, the frequency of birth weights under 2.5 kg is 31 % among poor women measuring less than 147 cm, as against 15 % for women of similar background but measuring more than 147 cm. The average woman's height in this group is 148 cm (1).

Furthermore, there is a converse relationship between the mother's height and the number of anencephalic infants born to her. Chronic malnutrition in grils also generates low weight and low weight for height, the consequences of which have been discussed above (cf. paragraph 2).

Other studies have shown the existence of a correlation between the mother's birth weight and that of her child.

Malnutrition and childhood infections have also been shown to delay puberty, which then occurs shortly before the beginning of adult sex life. This means that pregnancy may well occur soon after the first menstrual cycle, with the attendant consequences on the health of both mother and child (cf. paragraph 7).

10. SEXUAL MUTILATIONS

Excision, or clitoridectomy, is the removal of the clitoral gland or of the entire clitoris and of part or all of the labia minora. It may be limited to excision of the prepuce of the clitoris, leaving the clitoral gland and body intact. This is known as sunna in Muslim countries.

Infibulation, or pharaonic circumcision is the removal of the clitoris and the labia minora, and of part of the labia majora, and the suturing of the vulva, using thread or thorns, leaving only a small aperture for the outflow of urine and menstrual blood.

These sexual mutilations are practised in various parts of the world, but more particularly in West Africa, Sahelian Africa and the horn of Africa. According to the Women International Network News (1980), 74 million women and girls throughout the world have undergone excision or infibulation. These customs are still in practice in some wealthy, educated strata of the population.

The analysis of the sociocultural factors underlying these practices are beyond the scope of this issue. These customs are firmly anchored in traditional cultures, and have social, moral, symbolic and even mercantile explanations. They are a way of preserving the girl's virginity, of subduing her sexual desire and libido, by eliminating her erectile, erogenous organs, thus making sure she will be faithful. They parallel male circumcision, in that the woman is truly considered to be a woman once the clitoris, thought to represent her male side, has been removed (just as the man's prepuce is considered, in this case, to constitute his female side and thus to require removal). At the social level, this may be a means of social integration: all non-excised women are thought to be unpure, and therefore outlawed, and unable to marry. For parents, excision also represents a guarantee that they may offer a highly moral wife to a future husband: this ensures them of a large dowery.

In some Muslim countries, excision is considered a religious duty, dictated by the Koran. The **religious leaders** of Islam deny this, however. "We must therefore combat this

(1) A. LECHTIG et al. Maternal nutrition and foetal growth in developing societies. Am. J. Dis. Child. 1975, 40 ; 4 : 801-807.

custom, which is neither a religious duty nor a sunna, nor even a recommended custom" (Sheik Hassam Ahmed Abo Sahib of the Arda Omdourman Mosque in Sudan).

The age at which excision or infibulation is performed varies from one region to another: shortly after birth, at puberty, or even, in some ethnic groups, during the 7th month of pregnancy.

The operation is performed using a small, well-sharpened knife or a razorblade.

Since this region is highly vascularized and extremely sensitive, in close proximity to fragile organs such as the urethra and the bladder and plays an important part in childbirth, the complications generated by this operation are numerous, occasionally extremely serious and may lead to death.

When excision is performed, there may be:

— cataclysmic bleeding, resulting in death (especially when the entire clitoris is removed), or in hypovolemic shock and subsequent intense anaemia;
— acute infections caused by sepsis introduced by the instruments used or the traditional dressings placed on the wounds. Tetanus and septicaemia are particularly fearsome, since they result in death.

The girl's movements during the operation may lead to bruising or damage to the urethral orifice, the vagina or even the posterior perineum.

The extreme pain experienced, particularly during complete excision and infibulation may produce severe shock.

In the longer term:

— the most common complications are obstetrical. They are caused by vicious scars in the clitoral region, which are torn open when the foetus passes through the genital canal. Severe perineal tearing leads to haemorrhaging. Foetal suffering caused by prolonged labour linked with a hardened, sclerous vulva may result in definitive neurological damage to the child;
— chronic genital infections result in sterility;
— highly frequent urinary infections lead to miscarriages;
— the psychological consequences are also extremely serious, although they have received little attention. The terror experienced by the child or adolescent at the time remains deeply engraved in her mind, and predisposes her to anxiety, melancholia, depression, or even psychotic states;
— in their sex life, these women are often frigid and never experience orgasm.

All of these complications show the serious medical, social and psychological consequences of sexual mutilations for women.

From the health standpoint, the evolution of these customs toward their disappearance would be preferable. However, the psychosocial and cultural context makes the implementation of programmes aimed at this objective very difficult.

Most peoples are quite attached to this deeply rooted tradition, both for reasons linked with their security and because of the economic and psychological advantages which it procures. A survey done in rural and urban parts of Ethiopia shows the prevalence of female excision to be over 85 %; 75 % of the women questioned did not express any reproach with respect to these traditional practices and thought they should be maintained.

The enthusiasm with which some Westerners combat these customs shocks many people and does not contribute to a solution of the problem. Many countries have formulated proposals whose ultimate objective is the eradication of these practices: these are based on an analysis of the environment and of the human and material limits and resources. A summary of these may be found in the report issued by the Seminar on

traditional practices affecting the health of African women and children, organized by Senegal's Ministry of Public Health and the non-governmental study group on traditional practices affecting the health of women and children, held in Dakar in February 1984.

These proposals contain a number of measures: national agencies must take charge of this question, sterile instruments should be furnished for excision, traditional birth attendants and all health workers trained and educated so that they may examine these problems with villagers, the subject should be discussed in schools, mentalities changed, information campaigns undertaken by the media and health personnel, appropriate educational materials established, forums and seminars organized to increase the awareness of various civil and religious leaders who are in a position to modify the situation, information should be provided for men as well as for women.

CONCLUSION

This overview of the specific aspects of women's health is far from exhaustive. It has essentially focussed on the nutritional aspects linked with the reproductive function. Many problems which specifically affect some population groups have been excluded: women's low social status, sterility, sexually transmitted diseases, specific problems linked with infectious and parasitic diseases, dietary taboos, gynaecological ailments, and more specifically, cancers of the cervix and breast, etc.

Every programme aimed at improving the health status of the general population must take women's problems, in their specificity and their complexity, into consideration. In order to do so, these must first be recognized and studied, in the particular form they take in a given region.

Women's reproductive function makes them specially vulnerable to environmental factors. **Their health status is indissociable from that of the children in their womb, on their back or held to their breast, and of those of whom they are in charge, once weaned.**

All of those factors which contribute to the deterioration or improvement of women's health status have repercussions on their children, and will contribute to making them healthy, sturdy, creative adults, capable of partaking in the development of their community, or on the contrary, adults whose potential has been thwarted and who may well reproduce the same cycle.

Next, women who run increased risks must be identified. All of the factors discussed here are closely interrelated, and a great many women in developing countries and in the underprivileged communities within the developed countries cumulate these risks: low birth weight, protein-energy malnutrition during childhood, leading to small height and low weight, resulting in delayed puberty, with a first pregnancy early in adolescence, heavy household chores, farm work or urban activities. Pregnancies then occur in rapid succession, along with periods of breast-feeding, the risks of anaemia increase. These exhausted women give birth to still-born or low-birth-weight babies who, in turn, reproduce the same cycle.

Once these problems have been recognized, analysed and quantified, appropriate preventive measures corresponding to specific local conditions may be developed and applied at the national, regional, local and community levels, so as to make sure that all women, and particularly those who run the greatest risks, will achieve satisfactory physical, mental and social health, the effects of which will be felt on the next generation as well.

III. ACTIONS AIMED AT IMPROVING WOMEN'S HEALTH

We shall rapidly discuss a few examples of desirable actions aimed at promoting women's health.

1. EDUCATION

In most countries, it has been proved that a higher level of education for adult women has a most positive effect on the health of their children, which also requires the improvement of the mother's health status.

Table 21 illustrates this finding for three indicators, using overall data for a number of countries: the infant mortality rate, the per capita gross national product (which indicates the country's global wealth) and the percentage of illiterate adults, men and women. It shows that the infant mortality rate is correlated with women's illiteracy and with the difference between illiteracy in men and in women (at the women's expense), whereas all of these parameters are uncorrelated with the gross national product.

Table 21

Infant mortality, percentage of illiterates, per capita gross national product in various countries

Country	Infant mortality rate	Percentage of illiterates			Per capita GNP (in US$)
		Men	Women	Difference	
Central African Rep.	149	41	80	39	300
Guinea Bisau	149	58	85	27	160
Bangladesh	136	56	81	39	120
Ivory Coast	127	42	76	34	1,150
Algeria	118	40	77	33	1,920
Haiti	115	47	76	9	270
Togo	109	53	82	29	410
Morocco	107	59	82	23	860
Indonesia	93	22	42	20	420
Peru	88	11	28	17	930
Madagascar	71	59	73	14	350
Guatemala	70.2	41	57	16	1,110
Colombia	56	18	16	— 2	1,180
Thailand	55	7	17	10	670
Sri Lanka	37	18	24	6	270
Costa Rica	24.2	8	9	1	1,730
Cuba	19.3	4	5	1	?

Taken from : The State of the World's Children. 1982. Population Reference Bureau.

Although they require confirmation, these general trends in the developing countries seem to indicate that even the poorest countries may improve the health status of their children, and surely of the women who give birth to them, by expending a national effort to educate women (and men).

Caldwell (1) suggests three possible explanations for this phenomenon: educated mothers are less "fatalistic"; their demand for and use of health services is greater; the traditional balance in family relations is disturbed, the woman is less under the dependency of her mother-in-law, in particular, and takes more complete responsibility for her child's health.

In many countries, especially in Africa and the Eastern Mediterranean and South Central Asian countries, the much-needed effort to send girls to school is not given sufficient attention (table 22).

Table 22

Percentage of children enrolled in school in different parts of the world

	Percentage of children enrolled in			
	elementary school		secondary school	
	Boys	Girls	Boys	Girls
Developed countries	98	99	81	83
Africa	68	53	36	25
Latin America	89	88	64	58
South Central Asia	74	47	34	17
Western Mediterranean	78	65	60	37

Taken from : The State of the World's Children. 1982. Population Reference Bureau.

Just as the importance of women's educational level for improving their health and that of their children has been demonstrated at the national level, it has also been proved at the family level: when the mother's educational level is higher, infant mortality decreases, regardless of the family's socio-economic level. This is true if the father is also literate (as is almost always the case).

Globally speaking, however, the situation has not improved: in 1960, 58 % of illiterate adults were women. This figure was 60 % in 1980, and between 1970 and 1980 the number of illiterate men rose by 15 million, and the number of illiterate women by 48 million (2).

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(1) J.C. CALDWELL. Mother's education and infant mortality. World Health Forum. 1981, 2 ; 1.

(2) A. GILLETTE, J. RYAN. Onze interrogations sur l'alphabétisation pour les années 1990. Assignment children. UNICEF 1983, 63/64 : 23-50.

In most countries, girls and boys have an equal legal right to education. Girls receive less schooling for economic and cultural reasons: families are often financially unable to send all of their children to school. When faced with the necessity to choose, they tend to favour boys.

2. SURVEILLANCE OF PREGNANT WOMEN

As we have seen, pregnancy, with its extensive complications, represents a major health hazard for women. The surveillance of pregnant women at prenatal consultations held at times which are convenient for women is an inexpensive way of preventing the risks involved in pregnancy, detecting at-risk pregnancies, implementing the measures required in order to minimize their consequences for the mother and the foetus and providing health and nutritional education for women, including on all aspects of planned parenthood.

The practical implementation of such prenatal surveillance has been discussed in n° 152/153 of this journal.

The acts to be performed at these consultations have been strictly defined: accurate dating of the last menses in order to calculate the term, measurement of height and weight at the beginning of pregnancy, and of the evolution of weight and uterine height, taking of blood pressure and pulse, listening to the foetal heart, detection of anaemia by inspection of the colour of the mucosa or, better yet, by a blood count, detection of oedemas.

This is completed by an interview to determine the woman's age, gynaecological and obstetrical history, personal and family medical history, functional signs felt by the woman, medication taken, immunization against tetanus.

Physical examination of the woman includes inspection of the cervix using a speculum, manual examination of the vagina. Some laboratory tests may be performed on the basis of the clinical findings.

All of the findings collected at the prenatal consultation must be **interpreted** so that all appropriate action may be taken to safeguard the health of **the mother and of the child.**

These consultations should be taken as an opportunity to increase women's awareness of such questions as hygiene, diet, immunization, interbirth intervals and venereal diseases. They should also be used to prepare future mothers for breast-feeding.

Complications during delivery are exceptional when surveillance is performed regularly, the findings correctly interpreted and the necessary measures taken by competent personnel working in a calm, clean setting.

The child should be weighed at birth; this constitutes the starting point for post-natal surveillance, which is then adjusted to his/her health status: small-for-date, malformation, etc.

All properly filled-out records for pregnant women are kept at the health centre or maternity hospital and are regularly analysed so as to discover the main features of the course and outcome of pregnancies in **women in the community:** this may bring to light the major risk factors for that community, and lead to the refinement of specific preventive measures. The regular analysis of these records will show the evolution of the health status of the community's women in the course of time, and provide an assessment of the impact of the measures applied.

The analysis may include:

— charting of the weight gain during pregnancy of women who gave birth, under satisfactory conditions, to a child with a satisfactory birth weight;
— investigating the effects of parity, interbirth intervals, maternal age, weight and height on maternal morbidity, perinatal mortality and birth weight;

— a study of the outcome of pregnancy as correlated with the mother's living conditions, the season, the available food and the woman's work load.

Biostatisticians may then compile and analyse all findings at a regional and national level, in order to determine priorities and to contribute to the definition of high level programmes.

3. FOOD SUPPLEMENTATION

The interrelations between the mother's diet during pregnancy, the infant's birth weight and subsequent health status, proved by numerous studies, have led many countries to establish food supplementation programmes for pregnant and/or lactating women. Their objective is to increase the mother's food intake in order to improve the nutritional status of the mother-child dyad.

The impact of such programmes is assessed by the evolution of the birth weight of infants (or comparison with non-supplemented groups), occasionally by the evolution of maternal anthropometric or biochemical indicators and, even more rarely, by variations in the amount of milk secreted.

The results are extremely dissimilar, depending upon the country, the group of women receiving supplementation, the way in which the supplement is distributed, the proportion of the daily food intake which it represents, the time of pregnancy at which it is introduced, the woman's initial nutritional status, the time of year of delivery (1). It is therefore most difficult to draw any definite conclusions.

Although these studies were done in communities where the birth weight averages about 3,000 g, they all agree on one point: supplementation is more effective when the woman's nutritional status is precarious (low weight and/or height). The effect is nil or minor in well-nourished women (average increase in birth weight = about 50 g).

When supplements are given, but their actual intake by the mother is not checked, they are shared with the rest of the family, and the amount received is then minimal or nil, since the usual diet is often decreased accordingly.

While the third trimester of pregnancy was found in several studies to be the best time to introduce supplements, others disagree, indicating the need for supplementation throughout pregnancy.

Few investigations examine the effect of the amount of supplemental food. According to the Gambian study (2), however, it seems that an actual supplement (that is, a truly supplementary intake) of 431 Kcal/day during the season when the food supply is low and work in the fields is intensive, results in a substantial increase in birth weight (224 g) whereas the same supplement is not effective during the post-harvest season.

The effect of the quality of the supplement (the respective shares of energy and proteins) is not well known and certainly depends on the basic diet. The supplement should provide those elements which are lacking in the usual diet.

Some studies show that supplementation affects boys' birth weight, but not that of girls.

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(1) A. LECHTIG and R.E. KLEIN. Prenatal nutrition and birth weight : is there a causal association ? In : Maternal Nutrition in Pregnancy. Eating for Two ? Ed. John Dobling. Academic Press. 1981 : 131-156.

(2) A.M. PRENTICE et al. Dietary supplementation of lactation of Gambian women. I. Effects on breast milk volume and quality. Human Nutr. Clin. Nutr. 1983, 37 : 53-64.

Supplementation may enable mothers to be more active physically during their pregnancy and breast-feeding period, with no direct beneficial effect on birth weight. However, when the mother is more active, her relationship with her child improves, and this in turn contributes to the child's better psycho-motor development (1).

The effects of supplementary feeding of lactating women on the volume of breast milk also seem to depend upon a multitude of factors. In Gambia, an actual average annual supplement of 723 Kcal/day, whose composition more than covers the recommended intakes, did not increase the protein content of breast milk, even during the pre-harvest dearths, when the usual diet is extremely meager.

Nonetheless, it does seem that in situations where nutritional deficiency is great or protein intake quite insufficient, supplementation increases the amount of breast milk. Large-scale investigations are still lacking, however.

The concentration of fat-soluble vitamins in breast milk depends on dietary intake; the quality of these nutrients in the supplement influences their presence in the milk. The energy content of the milk is scarcely modified, on the other hand: the increased fat content is counterbalanced by a lower lactose content. Protein concentration is scarcely modified: only in Gambia was a 7 % increase found, bringing the protein content to a higher level than that of healthy English women (2).

The anthropometric measurements of women who received supplements during their pregnancy and breast-feeding periods do not seem to be improved in comparison with women whose nutritional status is moderately impaired (Formosa study).

Improved maternal diet during the last trimester of pregnancy or during lactation shortens the post partum amenorrhoea, probably because of a decreased circulating prolactin level. Thus, any improvement in the diet of pregnant and/or lactating women may lead to an increased birth rate and a shorter interval between births, in the absence of other types of action, and more particularly of the improvement of planned parenthood services. The negative effects of such situations for the health of both mother and child have been discussed above (cf. paragraph 3, chapter II).

Supplemental feeding programmes for mothers have never been studied with a view to their repercussions on the mother's health and on the short and long-term quality of life in general.

These dissimilar results show the need for closer study of the effects of supplementation on pregnant and/or lactating women in a given region. The analysis of these results should provide an evaluation of the beneficial effects, and indicate what type of distribution of food is best, as well as the characteristics of the mother-child couples for whom these supplements are beneficial, in order to improve the cost-effectiveness of this type of action.

Planners should also take into account the origin of the foodstuffs which enter into the supplement, and the type of technology required to produce them, in order to conciliate the objectives of economic development with those aimed at improving the people's health status.

Some people now recommend action before pregnancy, in order to improve the nutritional status of adolescent girls, thus bettering the chances of changing dietary habits. This would increase the women's pre-pregnancy weight and height.

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(1) L.S. ADAIR and E. POLLITT. Outcome of maternal nutritional supplementation : a comprehensive review of the Bacon Chow study. Am. J. Clin. Nutr. 1985, 41 : 948-978.

(2) A.M. PRENTICE et al. Op. cit.

Supplementary feeding of anaemic women: the administration, in the form of any sort of medication, of haematopoietic nutrients to pregnant and/or lactating women or to sexually active women suffering from nutritional anaemia has proved effective. However, such actions are difficult to implement, due to their cost and the logistic problems involved. Here too, a most accurate definition of the target population is required: that is, of anaemic or deficient women, whose biochemical parameters, and especially haemoglobin and haematocrit, are increased by supplementary feeding. Several questions must be answered: who are these women? when should the supplement be given? for how long? what supplement is best? (iron and/or folates and/or vitamin B12)? at what dose?

4. PLANNED PARENTHOOD

The worldwide investigation of fertility has shown the contrast existing in most countries between women's desire not to have any more children and the use of contraceptive methods. While 30 to 40 % of women use some birth control method in certain developing countries, this percentage is as low as 5 to 7 % in many others, and only touches women in the most privileged classes.

If a planned parenthood policy, necessary for the improvement of the health status of women, children and families, is to be implemented, the health personnel must agree with its principles and be trained for it, while access and use of such services by all women must be improved, particularly in rural areas and rapidly developing urban areas.

Other difficulties, more social in nature, tend to slow down the implementation of such policies. These include the pressure exerted on women, who are only granted true social status when they have given birth to a certain number of children, and of boy children in particular. We must therefore work at modifying such attitudes, by educating women (who are often quite convinced, in advance) and certainly men, even more, so that they share the responsibility for the decision to use a birth control method (particularly since the husband's agreement is required, in some countries), and decide together how many children they wish to have, and how far apart in age.

Such broad information on contraceptive techniques and the importance of planned parenthood for the family's health should be started at school, in the framework of sex education (cf. nº 154/155 of this journal). Couples would then be in a position to choose, and many pregnancies in adolescents would be avoided.

5. APPROPRIATE TECHNOLOGY

The conception of appropriate, acceptable technological innovations would reduce women's fatigue and expenditure of energy. In order to be truly effective, such action should be based on a study of women's work day, the intensity of their efforts and the time spent on each type of work.

Such action may for instance aim at reducing the energy spent on pounding grains (mills), drawing water (pumps), fetching wood (improved traditional stove using less wood), field work (improved tools), food processing (improved conservation techniques), etc.

If such changes do achieve their goals, they may have some perverse effects, however: sometimes the time gained by the woman is used for even harder labour, which in no way improves the woman's health, although it may increase the family income.

It is also most important to understand the consequences of development plans for women's work. Many programmes have simply increased it.

"Men and women are not affected in the same way by the modernization process. Whereas men's work becomes increasingly specialized, the lives of women are often still characterized by a set of multiple, necessary and urgent tasks, of which food production remains the most substantial. Whenever the organization of farming requires that much work be done by women, the amount of time devoted to other tasks such as food processing and preparation, cooking, hygiene in general and with respect to children in particular, may well be reduced." (1).

The introduction of money crops has led men to migrate to those regions where they are grown. Insufficient land productivity may also lead them to migrate to the cities. The women, who remain alone in the village, are then in charge of producing all of the food for the family's diet, and their work load is then substantially increased.

In addition, women are often excluded from the agricultural popularization programmes. They are not taught the modern farming techniques, and still use traditional methods which are more tiring and less productive. Investment and research in agriculture tend to concentrate on money crops, usually reserved for men, rather than survival farming, usually done by women.

6. LEGISLATION

Legislative action is fundamental to the improvement of women's health on a national scale. Once the government has voted the laws, it must provide means for applying and enforcing them. Such laws include:

- — equal rights and chances of men and women. This includes the right to education, work, equal pay for equal work, access to decision-making positions;
- — a minimum age for marriage, which would avoid some pregnancies in adolescents;
- — equal rights in case of divorce, particularly with respect to the sharing of property;
- — maternity leaves and the right to do less hard labour during pregnancy;
- — prolongation of maternity leaves in case of breast-feeding, and the right to take breaks from work in order to breast-feed the child;
- — legislation on abortion, whose positive effect on women's health has been amply proved.

According to the General Director of WHO, "it is quite clear that even in those countries which are politically engaged in improving women's condition by political and legislative measures, there are great differences between the spirit of the law and its application everywhere in the world, in the developed as well as in the developing countries".

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(1) Women, the production and handling of food, and nutrition. An FAO study. Food and nutrition. 1979, 8.

HEALTH PROBLEMS FACING RURAL WOMEN (1)

In the People's Republic of Benin, as in the rest of Africa, 80 % of women live in rural areas, where they work as hard or harder than men. Indeed, they are in charge of a variety of tasks: housework, providing water and wood for the entire family, cooking, washing clothing and dishes, care for the children, participation in farm work and animal husbandry, craftswork, small trade, etc.

All this in addition to women's very first role: childbearing (from conception to pregnancy and delivery), and the raising of her children.

This article is a discussion of some of the health problems experienced by rural women.

The first of these is **malaria,** which is not exclusively reserved for rural women. It is they, however, who are most exposed to bites by the mosquitoes which abound more particularly in the country. Indeed, so overwhelmed are they by household chores, at nightfall as well as at daybreak, that they often do not even feel these bites, and negligence and/or lack of information prevents them from taking antimalarial drugs. Only when fever or tenacious headaches occur do they decide to take a few nivaquine pills. Often they simply drink medicinal herb teas said to be "diuretic".

Next on the list is **malnutrition,** with anaemia as its corollary. It is caused by several factors:

- — ignorance, or more specifically a lack of information on what food should be eaten;
- — dietary customs and taboos deeply anchored in some families, and which deprive women of the nutrients required by their body, especially after childbirth. One example is the salt-free diet which a newly delivered woman must follow for seven days if the infant is a girl, and for nine days if it is a boy. Since it is not easy to eat salt-free meals, women generally eat only akassa (more or less fermented maize gruel), either diluted with water or - in the best of cases - with smoked fish;
- — lack of time: women are often too busy with household chores and/or their small trade or farm work, and do not even take the time to eat one or two meals. They are content with nibbling, usually something consistent which seems to provide energy;
- — financial difficulties: this is a serious problem for housewives. Indeed, mothers who have no financial resources to complete their husband's income are more preoccupied by the quantity of food they may buy to feed the family than by its qualitative aspect. Some husbands only furnish their wife with a certain quantity of grain (usually maize) plus 200 to 300 francs CFA* every four days (on market days) for their other purchases: condiments, fish, oil, soap, petrol, etc.

Here is one common example: a midwife saw a six-month pregnant woman at the prenatal consultation, and found her conjunctiva somewhat pale. Combantrin, ferrograd

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(1) Mrs. Angèle HOUDEGBE. Public health nurse at the C.R.D.S. (Centre Régional de Développement Sanitaire) in Cotonou, Benin.

* 1 franc CFA = 0,5 French franc, or approximately 0.07 U.S. $.

and nivaquine were prescribed, and bought by the husband immediately. One month later, however, the woman's state had not improved, and the midwife was obliged to question her about her diet. After avoiding the question for a while, she finally admitted that her husband only gave her maize plus 1,000 francs CFA each month for themselves and their two children.

In such cases - and they are the majority - the woman buys whatever she can, and not what would be needed to feed her family correctly.

In addition, there are intestinal parasitoses, mostly linked with a lack of food hygiene and general sanitation. Indeed, food used for immediate consumption is not protected, be it in the home, on roadsides or in the markets.

Furthermore, few families possess latrines; most people relieve themselves "where the wind blows", that is, in the open air, on manure piles or in the brush around the villages.

Children who spend their days playing in the sand and on the ground rarely wash their hands before eating.

The problems mentioned above affect men and children as well as women. Others, however, which will be discussed below, are specific to women.

Closely spaced pregnancies, which used to be rare in villages, are now increasingly frequent in rural areas. The reason for this is probably that newly delivered women are no longer sent to stay with their parents or their husband's parents, after childbirth, but stay with their husband.

Sometimes the husband is living in the city, and returns home on week-ends, or every other week-end, to see his family. There is no doubt that most illiterate women refuse birth control methods, since it means the end of childbearing to them.

Since planned parenthood is "unknown" in rural areas, most women bear a great many children: 8 to 10 or more. This is mostly because girls marry very young - between the ages of 16 and 18. **Placenta praevia** is a frequent condition in such women, and often results in the mother's death, since the delivery was done in a poorly equipped centre and the diagnosis was only made at the beginning of labour.

In the district maternity hospital in which I work, 389 women were delivered in 1984: there were three such cases, and two of the mothers died. All three had been transferred to a national hospital located 42 km away. One of the two women died after a caesarean section, while the second died during her transferral, through negligence on the part of both husband and wife.

The story is as follows. Dangboessi (the woman), went to weed her field early in the morning, although she was at term. Toward noon, she lost a great deal of blood. This did not worry her too much, since she did not feel any contractions, so she continued weeding until evening. After the evening meal she spoke of the fact to her husband, who did not think it very important either.

When the haemorrhaging began again in the middle of the night he was obliged to take his wife to the maternity centre. As soon as the midwife has examined her she wrote out an order for her transferral, but her husband decided to return home to take some money. When the midwife urged him not to do so, since she was anxious for them to leave for the hospital rapidly, he replied that he only had two kilometers to travel, and in any case could not leave for Cotonou without informing his family. He left at 1 in the morning, and only returned 2 hours later, since he did not travel 2 km but nearly 15. The woman died shortly after her arrival at the hospital.

Since women are constantly concerned with doing the most for their family and

satisfying all of their needs, they never rest during the day, are excessively tired and only sleep 5 to 6 hours a night.

In addition to their own specific health problems, mothers are often obliged to spend their nights watching, alone, over one or more sick children.

When faced with these problems, some men remain unmoved, and adopt a most disconcertingly carefree, irresponsible attitude when either their wife or their children are ill. Here is one typical case.

On 24th December 1984, a couple brought their 9 month-old baby to the district health centre for infected superficial burns extending over the two buttocks to the popliteal fossae. The nurse on duty immediately administered first aid, then hospitalized the child and sent the father to buy the necessary medication while the mother remained with her child. The father returned four days later, with only one of the drugs prescribed. During the 18 days that the child spent in the hospital, the father visited twice, and each time he gave the mother 300 francs CFA. Mother and child were thus left on their own, far from their village which was located 12 km from the health centre. They survived thanks to the generosity of the health personnel and of women who had come to the centre to give birth.

Here, in short, are some of the everyday problems encountered in rural areas. It should be clear, however, that these situations are not specific to rural areas, but that difficulties are greater there, due to:

— the lack of information on health matters;
— the distance from health centres;
— limited financial resources in the rural population;
— the precariousness of means of transportation, and the absence of an emergency transferral system.

ANNOUNCEMENT

The International Course in Food Science and Nutrition, annually held in Wageningen, The Netherlands, will in 1987 be focussed on the theme : "Maternal and Child Nutrition : the prevention of the main nutritional disorders in the world".

The course will be directed towards the alleviation of the nutrition and health problems of pregnant and lactating mothers and young children, being the most vulnerable groups in many developing countries.

The programme is designed to be of particular relevance to those who are responsible for or involved in the planning and implementation of programmes dealing with mother and child nutrition and health.

Requirements for admission :

- — academic degree (B.Sc. as a minimum), or its equivalent in nutrition, food technology, home economics, medicine or a related field of study ;
- — professional position with tasks related to the theme of the course and through which dissemination of the acquired knowledge is possible and can be expected ;
- — some years of practical experience related to the theme of the course ;
- — fluency in the English language.

Course period : 4 January - 6 June 1987.

Venue : International Agricultural Centre, Wageningen, The Netherlands.

Fellowships : The Netherlands Government has a number of fellowships available for this course. The Dutch diplomatic representative can inform prospective candidates about the procedure for a fellowship-application.

Language : This course will be conducted in English.

Application : For further information about the course programme and for application forms for the course, contact the Netherlands Embassy in your country or write to the course secretariate at the adress below. The closing date for application for the course as well as for a fellowship of the Netherlands Government is 30 August 1986.

Address : International Course in Food Science and Nutrition,
Lawickse Allee 11,
6701 AN Wageningen,
The Netherlands.
Tel. : 08370-19040.

THE QUANTITY AND QUALITY OF BREAST MILK

Report on the WHO Collaborative Study on Breast-Feeding. WHO Geneva, 1985.

The desirability of a multinational study on breast-feeding was advanced by the Thirteenth International Paediatric Congress in Vienna in 1971, and in the following year, a colloquium arranged by the International Children's Center in Abidjan recommended, inter alia, that WHO should play a leading role in the organization of such a study. It was also recommended that the latter should be carried out in two phases - the first dealing with the prevalence and duration of breast-feeding, and the second with the volume and composition of breast milk. In early 1973, WHO decided to implement these recommendations, the first phase of the study being initiated shortly thereafter. This phase was completed in 1976, and the results were published by WHO in 1981 in a book entitled

"Contemporary patterns of breast-feeding". Thereafter, plans were made to initiate the second phase to investigate more specifically the volume and composition of breast milk. This second study, the results of which are presented in this book, was timely in view of the questions that have been raised in recent years concerning the adequacy of breast-feeding by mothers living in the developing world, in circumstances that are not always conducive to the best nutritional status and the best physiological performance of the mothers.

It has been known for some time that mothers in developing countries tend to produce less milk than mothers living in developed countries. On the other hand, most of the information collected so far indicates that any differences in the composition of breast milk that may exist between mothers living in developed countries and those living in developing countries, do not modify significantly the nutritive value of the milk, especially its energy value. Most of this information, however, has been collected using different methods and is not strictly comparable ; it is therefore of doubtful value. In order to be able to compare data from different parts of the world, it has been stressed repeatedly that the methods used by different investigators should be rigorously standardized. The same applies to the determination of the various components of breast milk, and is particularly important with regard to the determination of trace elements. It is only by such rigorous standardization of methods that it will become possible to compare data on breast-milk quantity and quality from different races living under different ecological and socioeconomic conditions and, presumably, of different nutritional backgrounds.

This volume reports the results of the study concerning the quantity of breast milk, its composition in protein and non-protein nitrogen, lactose, fat, lactalbumin and lactoferrin, vitamin A, and vitamin C and the levels of pesticides present in the breast milk. The results of mineral and trace element determinations in breast milk will be reported in a subsequent volume.

It is a common observation that children in developing countries have a growth rate similar to that of children in developed countries up to the age of 3-4 months. Thereafter, their growth curves tend to flatten and diverge from those of children in developed countries. This observation has led many people to question the adequacy of breast-feeding after 3 months of age in developing countries - because either the volume of milk might be insufficient or its nutrient composition might be inadequate. The study reported here of lactating mothers living in contrasting socioeconomic conditions and in different geographical areas of the world was intended to answer such questions. If it were found that mothers in developed and developing countries produced equal quantities of milk of similar nutritional value then the reason for the suboptimal growth curve after 3-4 months of age would have to be sought elsewhere.

The present study was designed to provide easily interpretable information on some of the points raised above. The answers should be of great value not only in terms of what the nutrient requirements of an infant are, but also in terms of how and when to start supplementing the diet of a breast-fed infant. Tentative answers to these questions have been provided in the reports of several joint FAO/WHO scientific groups dealing with nutrient requirements, young child feeding, or both, but an answer supported by reasonably accurate facts collected in various environmental conditions is still required. It is hoped that this collaborative study will lead to recommendations on when and how to supplement the diets of breast-fed children, and that the results will form a basis for nutrition education and supplementation feeding programmes.

NOTICE

The following back issues of "Children in the Tropics" are still available:

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Theses issues may be purchased for 30 French Francs or 5 US Dollars each, by writing to the following address :

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